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-	2	jp-63109052-$.did.	EPO; JPO; DERWENT	2002/01/12 12:32
-	2	ep-465949-$.did.	EPO; JPO; DERWENT	2002/01/12 12:34
-	1	jp-53023705-$.did.	EPO; JPO; DERWENT	2002/01/12 12:35
-	2	jp-61036750-$.did.	EPO; JPO; DERWENT	2002/01/12 12:36
-	1	jp-61024451-$.did.	EPO; JPO; DERWENT	2002/01/12 12:37
-	2	jp-05230408-$.did.	EPO; JPO; DERWENT	2002/01/12 12:54
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-	18	(("4864324") or ("3964389") or ("4000334") or ("4149798") or ("4212018") or ("4225224") or ("4339472") or ("4384011") or ("4394661") or ("4396284") or ("4416215") or ("4420363") or ("4422083") or ("4451552") or ("4461663") or ("4469775") or ("4515877") or ("4521503")).PN.	USPAT; US-PGPUB	2002/01/12 13:51
-	14	(("4549923") or ("4555471") or ("4617085") or ("4620236") or ("5041359") or ("5139918") or ("5152225") or ("5171651") or ("5286594") or ("5351617") or ("5355890") or ("5367359") or ("5387496") or ("5607814")).PN.	USPAT; US-PGPUB	2002/01/12 13:59
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-	2	jp-03023705-$.did.	EPO; JPO; DERWENT	2002/01/12 14:50
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-	1	wo-9403839-$.did.	EPO; JPO; DERWENT	2002/01/12 14:53
-	2	wo-9012342-$.did.	EPO; JPO; DERWENT	2002/01/12 14:54
-	1	wo-9206410-$.did.	EPO; JPO; DERWENT	2002/01/12 14:55
-	1	ep-182332-$.did.	EPO; JPO; DERWENT	2002/01/14 14:13
-	1	ep-1138-$.did.	EPO; JPO; DERWENT	2002/01/12 15:14
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-	2	de-4107378-$.did.	EPO; JPO; DERWENT	2002/01/12 15:19
-	2	de-3342579-$.did.	EPO; JPO; DERWENT	2002/01/12 15:20
-	2	de-3537829-$.did.	EPO; JPO; DERWENT	2002/01/12 15:26
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EAST Database Search History cited in search Notes

02-02-04

Cynthia [illegible]

-	1	fr-2258649-$.did.	EPO; JPO; DERWENT	2002/01/12 15:29
-	1	GB-1492070-$.did.	EPO; JPO; DERWENT	2002/01/14 14:33
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-	2	ep-436320-$.did.	EPO; JPO; DERWENT	2002/01/14 07:02
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-	2	ep-634695-$.did.	EPO; JPO; DERWENT	2002/01/14 07:05
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-	694	430/273.1.ccls.	USPAT; US-PGPUB	2002/01/14 14:55
-	0	1995us-09432411.ap.	USPAT; US-PGPUB	2002/07/28 13:54
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-	769	ablat$ and carbon adj black and laser	USPAT; US-PGPUB	2003/02/23 17:40
-	13605	ablat$ and laser	USPAT; US-PGPUB	2003/02/23 17:41
-	1220	ablat$ and laser and 430/$.ccls.	USPAT; US-PGPUB	2003/02/23 17:46
-	751	ablat$ and laser and 430/$.ccls. and (ir infrared or infra adj red)	USPAT; US-PGPUB	2003/02/23 17:47
-	1	("4492750").PN.	USPAT; US-PGPUB	2003/02/24 11:08
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-	93	430/273.1.ccls. and @pd>20030219	USPAT; US-PGPUB	2004/02/02 12:42

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 NEWS  7  AUG 18  Simultaneous left and right truncation added to PASCAL
 NEWS  8  AUG 18  FROSTI and KOSMET enhanced with Simultaneous Left and Righ
                  Truncation
 NEWS  9  AUG 18  Simultaneous left and right truncation added to ANABSTR
 NEWS 10  SEP 22  DIPPR file reloaded
 NEWS 11  SEP 25  INPADOC: Legal Status data to be reloaded
 NEWS 12  SEP 29  DISSABS now available on STN
 NEWS 13  OCT 10  PCTFULL: Two new display fields added
 NEWS 14  OCT 21  BIOSIS file reloaded and enhanced

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               MACINTOSH VERSION IS V6.0b(ENG) AND V6.0Jb(JP),
               AND CURRENT DISCOVER FILE IS DATED 23 SEPTEMBER 2003
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FILE LAST UPDATED: 22 Oct 2003  (20031022/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.


=> s scott and laser and mask
          2873 SCOTT
        438832 LASER
         49760 MASK
L1           0 SCOTT AND LASER AND MASK

=> s ablat? and laser and mask
         29167 ABLAT?
        438832 LASER
         49760 MASK
L2         314 ABLAT? AND LASER AND MASK

=> s l2 and photo?
       1221586 PHOTO?
L3         145 L2 AND PHOTO?

=> s l3 and (infrared or infra red )
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        341600 RED
          3713 INFRA RED
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L4           0 L3 AND (INFRARED OR INFRA RED )

=> s l3 and (infrared or infra red  or ir)
        227177 INFRARED
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        519418 IR
L5           7 L3 AND (INFRARED OR INFRA RED  OR IR)

=> d all 1-7

L5   ANSWER 1 OF 7  CAPLUS  COPYRIGHT 2003 ACS on STN
AN   2003:270676  CAPLUS
DN   139:43788
TI   UV (ultraviolet) ps (picosecond)-laser with high peak power for
     micromachining
AU   Jacinavicius, Saulius; Raciukaitis, Gediminas
CS   Ekspla Ltd, Vilnius, LT-2028, Lithuania
SO   Laser Institute of America [Publication] (2002), 94(Congress Proceedings -
     Laser Materials Processing Conference [and] Laser Microfabrication
     Conference, 2002, Book 3), 2189-2197
     CODEN: LIAAED
PB   Laser Institute of America
DT   Journal
LA   English
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CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 47

AB Further progress in micro-technol. depends on the ability to create features of micron and sub-micron dimension. **Photo**-lithog., **ablation**, **photo**-polymn. are the processes, which are hard to imagine without an use of lasers. For micromachining of transparent and other material 2 diverse techniques are applied: deep-UV nanosecond and **IR** ultrafast (femtosecond) pulse lasers. Excimer lasers are good sources of UV light, but require **mask** projection for processing. Usage of hazardous gases and a short maintenance period are their disadvantages. **Ablation** with femtosecond (fs) pulses takes place almost without thermal influence, but fs-lasers with a chirped pulse amplification system are complicated equipment for industrial applications. That is the reason, why their usage is limited to scientific labs. An interest to ps lasers has increased recently. As compared to nanosecond solid-state **laser**, ps-**laser** pulses cause much lower heat load and produce narrow heat affected zone. Higher intensities lead to earlier evapn. of the material and redn. of the molten zone. Ps-lasers are simple in construction and maintenance, cheaper and much reliable than fs-lasers. They are attractive for micromachining application, because they give the possibility for precise processing. Due to extraordinary stability, efficiency and simplicity, all-solid-state passively mode-locked **laser** systems are of special interest to users. Increasing the power of pump lasers and improving the methods of mode locking result in shortening the generated pulses as well increasing the av. power of **laser** pulses and repetition rate. For passively mode-locked **laser**, timing jitter makes it difficult to synchronize pulses, their output energy is less stable due to the bleaching process. Active mode-locking with phase or amplitude modulation enables generation of **laser** pulses with lower jitter. The std. technique of generating high-energy picosecond pulses with Nd-based lasers relies on the known oscillator-regenerative amplifier method. The so-called 2-in-one is an alternative to this method. The 2-in-one concept features only one cavity, which serves as oscillator and regenerative amplifier.

ST UV picosecond **laser** micromachining

IT UV lasers
(picosecond; short pulse UV-**laser** with high peak power for micromachining)

IT Micromachining
(short pulse UV-**laser** with high peak power for micromachining)

IT Second-harmonic generation
Solid state lasers
(short pulse UV-**laser** with high peak power generated by using harmonic generation for micromachining)

IT 12005-21-9, YAG 12031-63-9, Lithium niobate (LiNbO3)
RL: DEV (Device component use); USES (Uses)
(short pulse UV-**laser** with high peak power generated by using harmonic generation for micromachining)

IT 7440-00-8, Neodymium, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(short pulse UV-**laser** with high peak power generated by using harmonic generation for micromachining)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L5 ANSWER 2 OF 7 CAPLUS
AN 2002:585862 CAPLUS
DN 138:137956
TI Tailor-made polymers for **laser ablation**
AU Lippert, Thomas; David, Christian; Hauer, Marc; Phipps, Claude; Wokaun, Alexander
CS Paul Scherrer Institut, Villigen PSI, 5232, Switz.
SO Reza Kenkyu (2001), 29(11), 734-738
CODEN: REKEDA; ISSN: 0387-0200
PB Reza Gakkai
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 73
AB **Photopolymers** based on triazene-groups were designed for UV **laser ablation**. The tested triazene-polymer reveals a low threshold fluence and unusually high **ablation** rates at low and high fluences. The polymer decomps. into gaseous products, resulting in clean **ablation** structures without surface contaminations. The triazene-polymer was also tested for two different applications at two different irradn. wavelengths, i.e. in the UV (308 nm) and in the near-**IR** (935 nm). Diffractive gray tone phase masks optimized for **laser ablation** were applied to fabricate microoptical elements. The triazene-polymer reveals also superior properties for applications in the near-**IR**. Near-**IR** irradn. is used to create a plasma which could be used as thruster for microsatellites. The carbon-doped triazene-polymer shows higher values of the momentum coupling coeff. and specific impulse than a com. polymer. The well-defined threshold for the max. momentum coupling coeff. was only obsd. for the designed polymer.
ST triazene **photopolymer laser ablation**
microoptic phase **mask** plasma thruster
IT Carbon black, uses
RL: MOA (Modifier or additive use); USES (Uses)
(Ketjen Black, triazene **photopolymer** doped with; design and properties of triazene **photopolymer** for **laser ablation**)
IT **Laser ablation**
Optical materials
Photomasks (lithographic masks)
Polymer morphology
(design and properties of triazene **photopolymer** for **laser ablation**)
IT Polyethers, properties
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(polyamine-, carbon black-doped; design and properties of triazene **photopolymer** for **laser ablation**)
IT Polyamines
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(polyether-, carbon black-doped; design and properties of triazene **photopolymer** for **laser ablation**)
IT 148030-84-6
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(carbon black-doped; design and properties of triazene **photopolymer** for **laser ablation**)

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD

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(20) Phipps, C; J Appl Phys 1988, V64, P1083 CAPLUS
(21) Phipps, C; Laser and Particle Beams 1994, V12, P23 CAPLUS
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(25) Srinivasan, R; Appl Phys Lett 1982, V41, P576 CAPLUS
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(28) Suzuki, K; Proc SPIE 1997, V2992, P98 CAPLUS
(29) Wei, J; J Phys Chem B 2001, V105, P1267 CAPLUS
(30) Yeh, J; Proc SPIE 1988, V922, P461 CAPLUS

L5 ANSWER 3 OF 7 CAPLUS

AN 2001:427326 CAPLUS

DN 135:38919

TI Method for imaging **photosensitive** printing plate having an **IR laser ablatable mask** layer

IN Teng, Gary Ganghui

PA USA

SO U.S., 9 pp.
CODEN: USXXAM

DT Patent

LA English

IC ICM G03F007-20
ICS G03F007-24; G03F007-40; G03F007-36

NCL 430303000

CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6245486	B1	20010612	US 2000-607400	20000630
PRAI	US 2000-607400		20000630		

AB This patent describes a method of imaging a printing plate comprising a substrate with **photosensitive** layer and top **laser ablatable mask** layer. The method includes imagewise exposing the plate with an **IR laser** to remove the **mask** layer in the exposed areas, overall exposing the plate with an actinic light to harden or solubilize the **photosensitive** layer in the areas where the **mask** layer has been removed, and further exposing the plate with the **IR laser** radiation

in the **laser** non-exposed areas to remove the remaining **mask** layer. The fully exposed plate can be developed to bare the substrate in the non-hardened or solubilized areas of the **photosensitive** layer.

ST printing plate **photosensitive IR laser ablatable mask** layer; lithog flexog printing plate **IR laser ablatable mask** layer

IT Carbon black, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Unisperse Black C E2N; printing plate comprising **photosensitive** layer and **IR laser ablatable mask** layer)

IT Flexographic printing plates
(**photosensitive**; printing plate comprising **photosensitive** layer and **IR laser ablatable mask** layer)

IT Lithographic plates
(printing plate comprising **photosensitive** layer and **IR laser ablatable mask** layer)

IT 67906-42-7
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(FC 120; printing plate comprising **photosensitive** layer and **IR laser ablatable mask** layer)

IT 60506-81-2
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(Sartomer SR 399; printing plate comprising **photosensitive** layer and **IR laser ablatable mask** layer)

IT 56-81-5, Glycerol, processes 3599-32-4, **IR** 125 7732-18-5, Water, processes 9011-14-7, Neocryl B-728 71868-10-5, Irgacure 907 139637-70-0, Airvol 603 344346-13-0, Ebecryl RX 8301
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(printing plate comprising **photosensitive** layer and **IR laser ablatable mask** layer)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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(4) Damme; US 5922502 1999 CAPLUS
(5) Fan; US 5888697 1999 CAPLUS
(6) Goffing; US 6020108 2000 CAPLUS
(7) Loerzer; US 6037102 2000 CAPLUS
(8) Peterson; US 4132168 1979 CAPLUS
(9) Sanders; US 3997349 1976 CAPLUS
(10) Takeda; US 5858604 1999 CAPLUS
(11) Teng; US 6014929 2000 CAPLUS
(12) Teng; US 6071675 2000 CAPLUS

L5 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:413823 CAPLUS

DN 136:205328

TI Industrial aspects of Nd-YAG **laser** microprocessing

AU Kathuria, Yash P.

CS Laser X Co. Ltd., Chiryu-shi Aichi-ken, 472, Japan

SO Proceedings of SPIE-The International Society for Optical Engineering (2001), 4157(Laser-Assisted Microtechnology 2000), 113-118
CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 63-7 (Pharmaceuticals)
Section cross-reference(s): 37, 55

AB For the last decade processing application with the Nd:YAG **laser** operating in the UV, visible and **IR** region has taken a new dynamic turn in the micro technol. It has covered a wide range of applications in microelectronics, semiconductors and screen printing as well as in the medical industries. From **laser ablation** to marking and from precision cutting to micro welding, it has opened a new horizon of industrial needs in micro technol. Of these, processing with the UV radiations have a unique characteristics of **ablation** and allow the prodn. of small micrometer order microstructures, but their industrial application has yet to be established. On the contrary, processing with the **IR** radiations usually considered as thermal processing covers mainly precision cutting of stencil **mask** for screen printing technol., micro processing of metallic stents for medical therapy and various other microstructuring applications. In all these processes, due to different scale length of the beam interaction time with the material, various phys. phenomenon are encountered that ultimately affect the quality of the end product. The present paper elaborates a few of these basic processes and explores the possibilities of current and new application areas.

ST **laser** microprocessing stent metal **mask** polymer stencil

IT Lasers
(industrial aspects of Nd-YAG **laser** microprocessing)

IT **Laser ablation**
Laser cutting
(industrial aspects of **laser** microprocessing)

IT Machining
(**laser**; industrial aspects of **laser** microprocessing)

IT Metals, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(masks; industrial aspects of **laser** microprocessing)

IT **Photomasks** (lithographic masks)
(metal; industrial aspects of **laser** microprocessing)

IT Stencils
(polymers; industrial aspects of **laser** microprocessing)

IT Polymers, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(stencils; industrial aspects of **laser** microprocessing)

IT Medical goods
(stents; **laser** microprocessing of biocompatible stents)

IT 11134-23-9, SUS 316L
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(**laser** microprocessing of biocompatible stents)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Anon; LPKF Metal/Polymer Stencil 1999
(2) Anon; Lambda Physik Highlights 2000, 57
(3) Durvasula, L; Proc CLEO' 95 Technical Digest 1995, P59
(4) Kathuria, Y; Proc LANE'97: 30th Intl CIRP Seminar 1997, P267
(5) Kathuria, Y; Proc of the Inter Symp on Micromechatronics and Human Science 1998, P111
(6) Takahara, K; Japanese J Gas Turbine Soc 1994, V22, P83
(7) Treusch, H; Proc SPIE 1986, V650, P220 CAPLUS

L5 ANSWER 5 OF 7 CAPLUS
AN 2000:441523 CAPLUS
DN 133:51238
TI Process for making large-size composite relief printing elements using **laser**-based positioning followed by image-wise exposure using a **laser**
IN Feil, Markus; Weidmann, Albrecht; Telser, Thomas

PA BASF Drucksysteme G.m.b.H., Germany
SO Eur. Pat. Appl., 7 pp.
CODEN: EPXXDW
DT Patent
LA German
IC ICM G03F009-00
ICS G03F007-20; G03F007-095
CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1014201	A2	20000628	EP 1999-124380	19991207
	EP 1014201	A3	20010516		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	DE 19859631	A1	20000706	DE 1998-19859631	19981223
	US 6352815	B1	20020305	US 1999-459649	19991213
	JP 2000194140	A2	20000714	JP 1999-376684	19991217
PRAI	DE 1998-19859631	A	19981223		

AB The title process comprises following steps: (a) providing a dimensional stable support with position marks, (b) positioning and fastening of at least 1 **photopolymerizable** relief printing plate with an **IR-ablatable** layer on the dimensional stable support with help of the position marks, (c) forming an image-**mask** by a **laser**, (d) exposing the plate with actinic light, and (e) removing unexposed parts of the printing plate with a developer.
ST manuf relief printing plate platemaking
IT **Photoimaging** materials
Photolithography
(process for making large-size composite relief printing elements using **laser**-based positioning followed by image-wise exposure using a **laser**)
IT Printing plates
(relief; process for making large-size composite relief printing elements using **laser**-based positioning followed by image-wise exposure using a **laser**)

L5 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1999:165427 CAPLUS
DN 130:274456
TI Recent advancements in MCM-L imaging and via generation by **laser** direct writing
AU Illyefalvi-Vitez, Zsolt; Ruszinko, Miklos; Pinkola, Janos
CS Department of Electronics Technology, Technical University of Budapest, Budapest, H-1111, Hung.
SO Proceedings - Electronic Components & Technology Conference (1998), 48th, 144-150
CODEN: PETCES
PB Institute of Electrical and Electronics Engineers
DT Journal; General Review
LA English
CC 76-0 (Electric Phenomena)
AB A review with 15 refs. The paper presents some preliminary results and describes the state of a research project that aims at the improvement of the quality of MCM-L circuit boards by the application of UV lasers for the following processes. 1. Pattern generation by direct writing using Nd:YAG (**IR**, visible or UV) **laser**. The copper clad laminate is covered by some protective layer, and the pattern is directly written to this layer by material removal (**ablation**). The pattern of the copper layer was prepd. either by wet chem. etching or applying the electroplating - stripping - etching process sequence. 2. **Photo-mask** exposure by direct writing. In this case a **photoresist** protective layer is exposed by a UV He-Cd **laser**, and after developing it was used for the conventional image

transfer process. 3. Through board via generation by contour direct writing using frequency multiplied Nd:YAG **laser**. It means that holes are drilled by moving the well-focused **laser** beam along their contour. 4. Blind via generation by controlled no. of pulses using the same frequency multiplied Nd:YAG **laser**. In this case the whole area of the via is exposed, and the hole is deepened shot by shot.

ST review laminated multichip module circuit imaging **laser** writing

IT Etching
(dry, **laser**-induced; recent advancements in MCM-L imaging and via generation by **laser** direct writing)

IT Lithography
(**laser** direct writing; recent advancements in MCM-L imaging and via generation by **laser** direct writing)

IT Etching
(**photochem.**, **laser**-controlled; recent advancements in MCM-L imaging and via generation by **laser** direct writing)

IT Electronic device fabrication
Imaging
Integrated circuits
Laser radiation
(recent advancements in MCM-L imaging and via generation by **laser** direct writing)

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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(2) Cable, A; Circuitree 1996
(3) Charlesworth, J; J Phys Chem 1993, V97, P5418 CAPLUS
(4) Contini Hennink, S; Photonics Spectra 1997, P116
(5) Electro Scientific Industries, Inc; Laser Drilling Techniques 1996
(6) Gal, L; Proceedings of the 18th International Spring Seminar on Electronics Technology 1995, P254
(7) Harsanyi, G; Second Pan Pacific Microelectronics Symposium and Tabletop Exhibition 1997
(8) Illyefalvi-Vitez, Z; Proceedings of the 47th Electronic Components and Technology Conference 1997, P502
(9) Jenny, S; Laser Focus World 1994, P121
(10) Millennia; Laser Forefront of Spectra-Physics 1996, No 6
(11) Moser, D; Printed Circuit Fabrication 1997
(12) Owen, M; Circuit World 1997, V24(No 1), P45
(13) Ruszinko, M; MIPRO'97 1997
(14) Toth, E; Proceedings of the 17th International Spring Seminar on Electronics Technology 1994, P333
(15) Westwind Multilase; Westwind data sheet 1997

L5 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:732099 CAPLUS
DN 128:28642
TI Method for making lithographic printing plate using imaging element comprising thermosensitive **mask**
IN Van Damme, Marc; Vermeersch, Joan
PA Agfa-Gevaert Naamloze Vennootschap, Belg.
SO Eur. Pat. Appl., 15 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM G03F001-00
ICS B41C001-10
CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 803771	A1	19971029	EP 1997-201048	19970408
	R: DE, FR, GB				
	US 5879861	A	19990309	US 1997-843588	19970416

JP 10062974 A2 19980306 JP 1997-115046 19970418
JP 2988885 B2 19991213
PRAI EP 1996-201085 19960423

AB According to the present invention there is provided a method for making a lithog. printing plate comprising the steps of providing an imaging element comprising on a support having a hydrophilic surface a **photosensitive** layer and a thermosensitive layer, said thermosensitive layer being opaque to light for which said **photosensitive** layer has spectral sensitivity and said thermosensitive layer comprising an **IR** pigment dispersed in a binder, mounting said imaging element on a drum, imagewise exposing said imaging element by means of an **IR laser** in an internal or external drum configuration thereby **ablating** said thermosensitive layer and rendering it imagewise transparent, overall exposing said imaging element with light to which said **photosensitive** layer has spectral sensitivity, and developing said imaging element to leave an ink-accepting image of said **photosensitive** layer on said support.

ST lithog plate **photosensitive** thermosensitive masking layer

IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Special Black 250; lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive masking layers contg.)

IT Aminoplasts
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive masking layers contg.)

IT Lithographic plates
(**photoimaging** materials with **photosensitive** layers and thermosensitive masking layers for manuf. of)

IT **Photoimaging** materials
(with **photosensitive** layers and thermosensitive masking layers for manuf. of lithog. plates)

IT 9004-70-0
RL: TEM (Technical or engineered material use); USES (Uses)
(E 950; lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive masking layers contg.)

IT 104-15-4, uses 9003-08-1, Cymel 301 86753-78-8, Solsperse 5000
199297-67-1, Solsperse 28000
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive masking layers contg.)

IT 57-09-0, Cetyltrimethylammonium bromide 574-93-6, Heliogen Blue D 7565
1652-63-7, Fluorad FC135 9003-20-7D, Poly(vinyl acetate), hydrolized
9011-14-7, Poly(methyl methacrylate) 114535-83-0, Fairmount Diazo 8
190086-16-9, Negalux N18
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with thermosensitive masking layers and **photosensitive** layers contg.)

=> d his

(FILE 'HOME' ENTERED AT 14:51:45 ON 23 OCT 2003)

FILE 'CAPLUS' ENTERED AT 14:51:58 ON 23 OCT 2003

L1	0	S SCOTT AND LASER AND MASK
L2	314	S ABLAT? AND LASER AND MASK
L3	145	S L2 AND PHOTO?
L4	0	S L3 AND (INFRARED OR INFRA RED)

```
L5                7 S L3 AND (INFRARED OR INFRA RED  OR IR)

=> s ablat? and laser and maske
         29167 ABLAT?
        438832 LASER
            10 MASKE
L6           0 ABLAT? AND LASER AND MASKE

=> s ablat? and laser and mask?
         29167 ABLAT?
        438832 LASER
         89663 MASK?
L7         441 ABLAT? AND LASER AND MASK?

=> s l7 and photo?
       1221586 PHOTO?
L8         200 L7 AND PHOTO?

=> d all 200
```

L8 ANSWER 200 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1984:463543 CAPLUS
DN 101:63543
TI Defect repair techniques for x-ray **masks**
AU Atwood, D. K.; Fisanick, G. J.; Johnson, W. A.; Wagner, A.
CS AT and T Bell Lab., Murray Hill, NJ, 07974, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1984), 471(Electron-Beam, X-Ray, Ion-Beam Tech. Submicrometer Lithogr. 3), 127-34
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB The problem of defects in x-ray **masks** is discussed along with techniques for their elimination. **Mask** fabrication and inspection techniques used at ATT and Bell Labs. are described. The processes of **laser ablation**, focused ion milling, and localized deposition are outlined, and their applicability to **mask** repair is considered. Examples of repairs made on a Si integrated circuit x-ray **mask** are presented.
ST x ray **mask** defect repair; lithog x ray **mask** repair
IT Electric circuits
(integrated, x-ray **masks** for fabrication of, defect repair techniques for)
IT **Photomasks**
(x-ray, defect repair techniques for)

=> d all 150-199

L8 ANSWER 150 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:623027 CAPLUS
DN 123:10815
TI **Laser**-induced **ablation** of polymers using a patterned dopant generated from a leuco-dye precursor via flood exposure: a "portable conformable **mask**" approach to **laser ablation** of PMMA at 351 nm
AU Holtz, S.; Bargon, J.
CS Inst. Phys. Theor. Chem., Univ. Bonn, Bonn, D-53115, Germany
SO Applied Physics A: Materials Science & Processing (1995), A60(6), 529-35
CODEN: APAMFC
PB Springer
DT Journal
LA English

CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 35, 74

AB A two-stage **laser ablation** process is described, which initially generates a **laser**-light absorbing image from a conventional **photolithog. mask** via a UV-flood exposure step. For this purpose a colorless precursor of a dye, i.e., its leuco form, is imbedded into the polymer to be **ablated** as a dopant. For poly(Me methacrylate) as such a polymer, triphenylmethanol, the leuco precursor for the corresponding triphenylmetyl dye represents a good choice for **ablation** with excimer lasers operating at the wavelength 351 nm. In this fashion conventional **masks** and exposure tools of UV-**photolithog**. may be used in combination with **laser ablation**,. The resulting images are characterized by a good contrast and reasonably sharp contours. The **photochem**. mechanism and addnl. aspects of this two-step process, which resembles the "portable conformal **mask**" approach of **photolithog**., are outlined.

ST PMMA **ablation** portable conformable **mask**

IT **Ablation**
(**laser**-induced, of PMMA via portable conformable **mask** approach using leuco-dye precursor)

IT 76-84-6, Triphenylmethanol
RL: NUU (Other use, unclassified); USES (Uses)
(dye; **laser**-induced **ablation** of PMMA via portable conformable **mask** approach using leuco-dye precursor)

IT 9011-14-7, PMMA
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**laser**-induced **ablation** of PMMA via portable conformable **mask** approach using leuco-dye precursor)

L8 ANSWER 151 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1995:438643 CAPLUS

DN 123:44200

TI High resolution UV **laser** repair of phase shifting **photomasks**

AU Yang, Baorui; Chuang, Yung-Ho; Liu, Kuo-Ching

CS Excel/Quantronix Corporation, Hauppauge, NY, 11788, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (1994), 2322(14th Annual Symposium on Photomask Technology and Management, 1994), 35-47
CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Processes for repairing defects on phase shifting **masks** have been developed at Excel/Quantronix. The processes are based on DUV (248 nm) **laser ablation** and DUV **laser**-assisted chem. vapor deposition. The light source of the repair system consists of a gain-switched Ti:Sapphire **laser** system. The 248 nm wavelength is obtained by frequency tripling. The all-solid-state **laser** provides high stability, short pulse duration, and good beam quality required by the repair processes. By significantly improving the optical system, we are capable of repairing features with a diam. of approx. 0.2 .mu.m. The repair of programmed defects such as 0.5 .times. 0.5 .mu.m2 extra quartz phase shifter (with or without chrome on top) and 1 .times. 1 .mu.m2 phase divots have been successfully demonstrated and examd. by the aerial image measurement system (AIMS) developed by IBM. After opaque defect repair, the repaired area exhibits a transmission greater than 95% for both I-line and 248 nm. Clear defects are repaired in an open-air environment with controlled transmission. The deposited films show good uniformity and sharp edges. Extra quartz phase shifter defects are reliably repaired in an open-air environment with the technique of **laser ablation** by surface enhancement (LASE), which was developed at Excel/Quantronix. Phase divots have been successfully

repaired by **photolytic** deposition of SiO2 in a vacuum system
using a single precursor, without the need of an oxidizing co-reactant.
The repair techniques developed by Excel/Quantronix have broad
applicability to a wide variety of conventional and phase shifting
photomasks.

ST UV **laser** repair phase shifting **photomask**;
laser ablation chem vapor deposition **photomask**

IT **Photomasks**
(high resoln. UV **laser** repair of phase shifting
photomasks)

IT **Photolysis**
(repair of phase divots by **photolytic** deposition of silica in
vacuum system using single precursor)

IT Vapor deposition processes
(**laser ablation**, **laser ablation**
and **laser**-assisted chem. vapor deposition for repairing
defects on phase shifting **masks**)

IT **Ablation**
(**laser**-induced, **laser ablation** and
laser-assisted chem. vapor deposition for repairing defects on
phase shifting **masks**)

IT 13007-92-6, Chromium hexacarbonyl 14040-11-0, Tungsten hexacarbonyl
RL: NUU (Other use, unclassified); USES (Uses)
(tungsten- and chromium-hexacarbonyl precursors for repairing defects
on phase shifting **masks**)

L8 ANSWER 152 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:414407 CAPLUS
DN 122:326217
TI Analysis of grating formation with excimer **laser** irradiated
phase **masks**
AU Dyer, P. E.; Farley, R. J.; Giedl, R.
CS University of Hull, Department of Applied Physics, Cottingham Road, Hull,
HU6 7RX, UK
SO Optics Communications (1995), 115(3,4), 327-34
CODEN: OPCOB8; ISSN: 0030-4018
PB Elsevier
DT Journal
LA English
CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other
Reprographic Processes)
AB Excimer **laser** irradiated phase **masks** provide a
convenient and effective method for writing micron-scale gratings for
optoelectronic device applications. Here we analyze the interference
field produced by a periodic **mask** and assess the near-field
energy d. and fluence distribution for varying degrees of order content
when exposed using an excimer **laser** with finite spatial and
temporal coherence. Results are compared with exptl. findings for
gratings produced on **ablated** polymers and in optical fibers.
ST diffraction grating excimer **laser** phase **mask**
IT Diffraction gratings
Photomasks
(anal. of grating formation with excimer **laser** irradiated
phase **masks**)

L8 ANSWER 153 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:377352 CAPLUS
DN 122:303626
TI **Laser** via **ablation** technology for MCMs thin film
packaging - past, present, and future at IBM microelectronics
AU Patel, R. S.; Redmond, T. F.; Tessler, C.; Tudryn, D.; Pulaski, D.
CS Microelectronics Division, IBM, Hopewell Junction, NY, 12533-6531, USA
SO Proceedings of SPIE-The International Society for Optical Engineering
(1994), 2369(27th International Symposium on Microelectronics, 1994),
31-41

CODEN: PSISDG; ISSN: 0277-786X
DT Journal; General Review
LA English
CC 76-0 (Electric Phenomena)
Section cross-reference(s): 73
AB A review with 21 refs. IBM has pioneered **laser** via **ablation** technol. and its use in multichip module's (MCMs) high d. multi-level thin film packaging. The authors describe the maturing of **laser** via **ablation** technol. within IBM. The evolution of technol. from the invention of **laser ablation** in the early 1980s to current state of the art manufg. level via technol. was described. The three major aspects of **laser ablation** via technol. described are the **ablation** process, **mask** technol., and tooling. The details on **mask** technol. development and the development of three generations of tool sets are described along with a comparison of the **laser** via process with **photosensitive** polymer, reactive ion etching, and wet etch via processes. The future direction for **laser ablation** via technol. is discussed based on the demands imposed by the future thin film packaging requirements within IBM.
ST review **laser ablation** via packaging
IT Electronic device packaging
Laser radiation
(**laser** via **ablation** technol. for multichip module thin film packaging)
IT Electric conductors
(interconnections, **laser** via **ablation** technol. for multichip module thin film packaging)
IT **Ablation**
(**laser**-induced, **laser** via **ablation** technol. for multichip module thin film packaging)

L8 ANSWER 154 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:364659 CAPLUS
DN 122:277940
TI Structuring of polyimide-metal carbide layer systems by excimer **laser ablation**
AU Ihlemann, J.; Wolff-Rottke, B.; Danev, G.; Petkov, K.; Spassova, E.
CS Laser-Laboratorium Goettingen e.V., Hans-Adolf-Krebs-Weg 1, Gottingen, D-37077, Germany
SO Applied Surface Science (1995), 86(1-4), 245-50
CODEN: ASUSEE; ISSN: 0169-4332
PB Elsevier
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 66
AB **Laser** microlithog. has been one of the most rapidly developing lithog. methods in the last years. The possibility of using thin metal carbide layers deposited on polyimide coated substrates has been investigated. The deposition conditions of thin polyimide (.ltoreq.1 .mu.m) and carbide (40 nm) films for lithog. applications were detd. UV **laser ablation** of the metal carbide layers was performed at different wavelengths. **Ablation** threshold fluences are around 20-90 mJ/cm2. Clean **ablation** with high edge definition by one single **laser** pulse is achieved at about 40-200 mJ/cm2 leaving a smooth polyimide surface. At 248 nm **ablation** using two different pulse durations (32, 81 ns) was performed, but no significant differences could be found. Microstructures can be produced by **ablation** using **mask** imaging techniques. These results demonstrate the applicability of polyimide-metal carbide layer combinations as lithog. systems for a full dry process: **laser-ablation**-structuring of the carbide image layer and subsequent image transfer by reactive ion etching of the polyimide.

ST laser ablation metal carbide film photolithog
IT Etching
Photomasks
(**laser ablation** of metal carbide films as lithog. process based on bilayer system with dry deposition and structuring)
IT Polyimides, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(**laser ablation** of metal carbide films as lithog. process based on bilayer system with dry deposition and structuring)
IT **Ablation**
(**laser**-induced, **laser ablation** of metal carbide films as lithog. process based on bilayer system with dry deposition and structuring)
IT Lithography
(**photo**-, **laser ablation** of metal carbide films as lithog. process based on bilayer system with dry deposition and structuring)
IT 7782-44-7, Oxygen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(etchant; **laser ablation** of metal carbide films as lithog. process based on bilayer system with dry deposition and structuring)
IT 12069-32-8, Boron carbide (B4C) 12070-08-5, Titanium carbide (TiC)
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**laser ablation** of metal carbide films as lithog. process based on bilayer system with dry deposition and structuring)
IT 89-32-7, Pyromellitic dianhydride 101-80-4
RL: RCT (Reactant); RACT (Reactant or reagent)
(monomer; **laser ablation** of metal carbide films as lithog. process based on bilayer system with dry deposition and structuring)

L8 ANSWER 155 OF 200 CAPLUS
AN 1995:344646 CAPLUS
DN 123:10807
TI **Laser ablation** of nonlinear-optical polymers to define low-loss optical channel waveguides
AU Chon, Joseph C.; Comita, Paul B.
CS Almaden Research Center, IBM, San Jose, CA, 95120-6099, USA
SO Optics Letters (1994), 19(22), 1840-2
CODEN: OPLEDP; ISSN: 0146-9592
DT Journal
LA English
CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 74
AB **Laser photoablation** of polymeric channel waveguides with embedded contact **masks** is described. The **ablation** technique is capable of forming low-optical-loss waveguides with an end-face quality suitable for pigtailed devices at rapid rates. The optical-mode profiles and the optical-loss measurements are reported, and SEM characterization and **laser ablation** rate measurements are described. The end-face quality processed by **laser ablation** is sufficiently good for end-fire coupling and thus can permit the elimination of polishing steps.
ST **laser photoablation** polymeric channel waveguide; **photochem ablation** polymeric channel waveguide
IT Waveguides
(**laser ablation** of nonlinear-optical polymers to define low-loss optical channel waveguides)
IT Plastics
Polymers, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**laser ablation** of nonlinear-optical polymers to

```
        define low-loss optical channel waveguides)
IT   Ablation
        (light-induced, of nonlinear-optical polymers to define low-loss
        optical channel waveguides)

L8   ANSWER 156 OF 200  CAPLUS  COPYRIGHT 2003 ACS on STN
AN   1995:261225  CAPLUS
DN   122:44155
TI   Apparatus and process for the production of fine line metal traces
IN   Hunter, Robert O., Jr.; Smith, Adlai H.; McArthur, Bruce B.
PA   Litel Instruments, USA
SO   U.S., 12 pp.
     CODEN: USXXAM
DT   Patent
LA   English
IC   ICM  B44C001-22
     ICS  C23F001-00; B29C037-00
NCL  156630000
CC   76-2 (Electric Phenomena)
FAN.CNT 1
     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
PI   US 5364493         A    19941115      US 1993-58906    19930506
     WO 9426495         A1   19941124      WO 1994-US5084   19940506
         W:  AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, HU,
             JP, KG, KP, KR, KZ, LK, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL,
             PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, UZ, VN
         RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,
             BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG
     AU 9469081         A1   19941212      AU 1994-69081    19940506
PRAI US 1993-58906           19930506
     WO 1994-US5084          19940506
AB   A metallic substrate such as Cu foil has an etch barrier such as
     polyimide, Saran Wrap, or other plastic applied. This barrier is
     thereafter selectively etched or ablated with a laser,
     e.g. by passing the light through a phase reticle or phase mask
     having at least the image information for the fine metallic lines thereon.
     The remaining barrier then acts in a 2nd etch process to remove the
     underlying metallic layer.  A wet or dry etch (such as RIE) may be
     employed.  Over conventional photoresist exposure methods, the
     developer and resist steps are eliminated.  The laser can
     precisely pattern the barrier in a single step with the remainder of the
     prodn. of the required metallic fine lines relying on a simple wet etch, a
     process whose control parameters are well understood and consume little
     time.  Alternately, a process for the direct ablation of
     metallic layers is disclosed.
ST   metal line prodn method app; copper foil etching fine line prodn; plastic
     etch barrier copper foil
IT   Ablation
     Etching
       Laser radiation
        (app. and process for prodn. of fine line metal traces)
IT   Plastics, film
     Polyimides, processes
     RL: DEV (Device component use); PEP (Physical, engineering or chemical
     process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES
     (Uses)
        (app. and process for prodn. of fine line metal traces)
IT   75-35-4, processes
     RL: DEV (Device component use); PEP (Physical, engineering or chemical
     process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES
     (Uses)
        (Saran; app. and process for prodn. of fine line metal traces)
IT   7440-50-8, Copper, processes
     RL: DEV (Device component use); PEP (Physical, engineering or chemical
```

process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(app. and process for prodn. of fine line metal traces)

L8 ANSWER 157 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:189577 CAPLUS
DN 122:39252
TI Velocity selection of fast **laser ablated** aluminum atoms by temporally and spatially specific **photoionization**
AU Macler, Michel; Fajardo, Mario E.
CS Propulsion Directorate/RKFE, Philips Lab., Edwards AFB, CA, 93524-7680, USA
SO Applied Physics Letters (1994), 65(18), 2275-7
CODEN: APPLAB; ISSN: 0003-6951
PB American Institute of Physics
DT Journal
LA English
CC 65-4 (General Physical Chemistry)
Section cross-reference(s): 73
AB The successful demonstration of velocity selection of fast aluminum atoms by a novel, nonmech. technique is reported. Pulses of atoms with broad velocity distributions are produced by **laser ablation** of aluminum metal. A second pulsed **laser**, delayed by .apprx.1 .mu.s and crossed at a right angle to the at. beam, is used to **photoionize** only those atoms with unwanted velocities, i.e., atoms moving too fast or too slow to be hidden behind an opaque **mask** placed .apprx.1 cm from the **ablated** surface. The **photoions** are subsequently deflected from the beam by a static magnetic field. Velocity selected Al atom fluxes equiv. to .PHI. .apprx. 1011 atoms/(cm2 eV pulse) at a working distance of 10 cm are demonstrated.
ST velocity **laser ablated** aluminum beam **photoionization**
IT Atomic beams
Ionization, **photo-**
Lasers
Magnetic field
Surface
(velocity selection of fast **laser ablated** aluminum atoms by temporally and spatially specific **photoionization**)
IT 7429-90-5, Aluminum, properties
RL: PRP (Properties)
(velocity selection of fast **laser ablated** aluminum atoms by temporally and spatially specific **photoionization**)

L8 ANSWER 158 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:179805 CAPLUS
DN 122:278356
TI **Laser ablation** vs. **photochemical** vapor deposition
AU Hanabusa, Mitsugu
CS Department Electrical and Electronic Engineering, Toyohashi University Technology, Toyohashi, 441, Japan
SO Proceedings of the International Conference on Lasers (1994), Volume Date 1993, 16TH, 55-62
CODEN: PICLDV; ISSN: 0190-4132
DT Journal; General Review
LA English
CC 75-0 (Crystallography and Liquid Crystals)
AB A review, with 24 refs. **Laser ablation** and **photochem**. vapor deposition (**photo**-CVD) have emerged as new thin film deposition methods. **Laser ablation** is a phys. method based on vaporization of a target material by a pulsed **laser**. It was characterized by simplicity of the app. used for deposition, compositional fidelity between the target and the deposit, good crystallinity, reactivity, and a high instantaneous growth speed.

Many of these features make **laser ablation** suitable for depositing thin film ceramics, like thin film high Tc superconductors. However, in **photo**-CVD light was used to induce a chem. reaction for source gases. It was characterized by low-temp. deposition and a versatility of reactions leading to deposition. These features made **photo**-CVD useful for the prodn. of a variety of thin film semiconductors, metals and insulators. A **maskless** prodn. of patterned thin films is made possible by **laser** direct writing. There are some problems to be solved before these **photoinduced** deposition methods become practical tools for thin film prodn.

ST review **laser ablation photochem** CVD

IT Vapor deposition processes
(**photochem**.; for films in relation to **laser ablation** in deposition)

IT **Ablation**
(**laser**-induced, for film deposition in relation to **photochem**. vapor deposition)

L8 ANSWER 159 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1995:93820 CAPLUS

DN 122:45091

TI Molecular sieve-based chemical sensors

AU Sottile, Laura J.; Balkus, Kenneth J., Jr.; Riley, Scott J.; Gnade, Bruce E.

CS Department of Chemistry, University of Texas at Dallas, Richardson, TX, 75083-0688, USA

SO Materials Research Society Symposium Proceedings (1994), 351(Molecularly Designed Ultrafine/Nanostructured Materials), 263-8
CODEN: MRSPDH; ISSN: 0272-9172

DT Journal

LA English

CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 76, 80

AB By virtue of their shape selectivity and stability, mol. sieves are ideal components for discriminating chem. sensors. In this paper we report the prepn. of capacitance type sensors based on $AlPO_4$ mol. sieves. Thin films of the mol. sieves $AlPO_4$-5, $AlPO_4$-H3, and $AlPO_4$-H1, which cover a range of pore dimensions, were deposited on Ti nitride coated Si wafers by **laser ablation**. A subsequent hydrothermal treatment followed by a Pd/Au coating and the application of std. **photoresist/masking** techniques were used to generate the capacitors. The mol. sieves exhibit significant changes in capacitance upon exposure to target mols., including CO_2, CO, N_2, H_2O, and toluene.

ST mol sieve based chem sensor

IT Sensors
(mol. sieve-based capacitance-type)

IT Zeolites, uses
RL: DEV (Device component use); USES (Uses)
(aluminophosphate, Mol. sieve-based chem. sensors)

IT 108-88-3, Toluene, analysis 124-38-9, Carbon dioxide, analysis
630-08-0, Carbon monoxide, analysis 7727-37-9, Nitrogen, analysis
7732-18-5, Water, analysis
RL: ANT (Analyte); ANST (Analytical study)
(Mol. sieve-based chem. sensors for)

IT 7784-30-7, Aluminum phosphate
RL: DEV (Device component use); USES (Uses)
(chem. sensors based on $AlPO_4$ mol. sieves)

IT 25583-20-4, Titanium nitride TiN
RL: DEV (Device component use); USES (Uses)
(chem. sensors based on $AlPO_4$ mol. sieves coated on)

IT 7440-21-3, Silicon, uses
RL: DEV (Device component use); USES (Uses)
(chem. sensors based on $AlPO_4$ mol. sieves coated on titanium nitride on)

IT 7440-05-3, Palladium, uses 7440-57-5, Gold, uses

RL: DEV (Device component use); USES (Uses)
(in fabrication of mol. sieve-based chem. sensors)

L8 ANSWER 160 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:34163 CAPLUS
DN 122:150232
TI **Laser** ionization mass spectrometry [in microanalysis of solids]
AU Odom, R. W.; di Brozolo, F. Radicati
CS Charles Evans Assoc., Redwood City, CA, 94063, USA
SO Microanal. Solids (1994), 269-84. Editor(s): Yacobi, B. G.; Holt, D. B.; Kazmerski, Lawrence L. Publisher: Plenum, New York, N. Y.
CODEN: 60EGAE
DT Conference; General Review
LA English
CC 79-1 (Inorganic Analytical Chemistry)
Section cross-reference(s): 38, 56, 73, 76, 80
AB Instrumentation and applications are reviewed. Applications representative of the range of utility of the LIMS technique were performed in the authors' lab. They include bulk anal., surface anal., **laser** postionization, and polymer anal.
ST review **laser** ionization mass spectrometry analysis; microanalysis solids **laser** ionization mass spectrometry
IT Soldering
(LIMS contaminant microanal. of defective surface in study of solder dewetting in relation to printed circuit boards)
IT Surface analysis
(**laser** ionization mass spectrometry)
IT Polyimides, analysis
Polymers, analysis
RL: AMX (Analytical matrix); PRP (Properties); ANST (Analytical study)
(**laser** ionization mass spectrometry in microanal. of solids)
IT Epoxy resins, analysis
RL: ANT (Analyte); OCU (Occurrence, unclassified); ANST (Analytical study); OCCU (Occurrence)
(solder **mask** residue; LIMS contaminant microanal. of defective surface in study of solder dewetting in relation to printed circuit boards)
IT Resists
(**photo**-, **laser** ionization mass spectrometry in microanal. of solids)
IT Mass spectrometers
Mass spectrometry
(**photoionization**, **laser**-induced, in microanal. of solids)
IT 1315-09-9, Zinc selenide (ZnSe)
RL: AMX (Analytical matrix); PRP (Properties); ANST (Analytical study)
(LIMS contaminant microanal. of ZnSe epitaxial layer on GaAs)
IT 7440-43-9, Cadmium, analysis 13494-80-9, Tellurium, analysis
RL: ANT (Analyte); OCU (Occurrence, unclassified); ANST (Analytical study); OCCU (Occurrence)
(LIMS contaminant microanal. of ZnSe epitaxial layer on GaAs)
IT 1303-00-0, Gallium arsenide, analysis
RL: ARU (Analytical role, unclassified); PRP (Properties); ANST (Analytical study)
(LIMS contaminant microanal. of ZnSe epitaxial layer on GaAs)
IT 16887-00-6, Chloride, analysis 24959-67-9, Bromide, analysis
RL: ANT (Analyte); OCU (Occurrence, unclassified); ANST (Analytical study); OCCU (Occurrence)
(etching soln. residue; **laser** ionization mass spectrometry in contaminant microanal. of defective window etched through **photoresist** on CdHgTe substrate for Al contact)
IT 7429-90-5, Aluminum, analysis 29870-72-2, Cadmium mercury telluride (CdHgTe)
RL: ARU (Analytical role, unclassified); DEV (Device component use); PRP (Properties); ANST (Analytical study); USES (Uses)

(**laser** ionization mass spectrometry in contaminant microanal. of defective window etched through **photoresist** on CdHgTe substrate for Al contact)

IT 12063-98-8, Gallium phosphide, analysis
RL: AMX (Analytical matrix); PRP (Properties); ANST (Analytical study)
(**laser** ionization mass spectrometry in microanal. of defective light-emitting diode)

IT 7440-50-8, Copper, analysis
RL: ANT (Analyte); OCU (Occurrence, unclassified); PRP (Properties); ANST (Analytical study); OCCU (Occurrence)
(**laser** ionization mass spectrometry in microanal. of solids)

IT 109064-29-1D, Barium copper yttrium oxide (Ba2Cu3YO7), oxygen-deficient
RL: AMX (Analytical matrix); PEP (Physical, engineering or chemical process); PRP (Properties); ANST (Analytical study); PROC (Process)
(**laser** postionization in measurement of velocity distribution of neutral species produced from UV **laser ablation** of superconductor)

IT 1304-28-5, Barium oxide, analysis 7440-39-3, Barium, analysis 7440-65-5, Yttrium, analysis
RL: ANT (Analyte); PRP (Properties); ANST (Analytical study)
(**laser** postionization in measurement of velocity distribution of neutral species produced from UV **laser ablation** of superconductor)

IT 80-05-7, Bisphenol A, analysis
RL: ANT (Analyte); OCU (Occurrence, unclassified); ANST (Analytical study); OCCU (Occurrence)
(solder **mask** residue; LIMS contaminant microanal. of defective surface in study of solder dewetting in relation to printed circuit boards)

L8 ANSWER 161 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:641537 CAPLUS
DN 121:241537
TI **Laser** repair of phase shifting **masks**
AU Chuang, Yung-Ho; Yang, Baorui; Garkavy, Victor; O'Connor, John; Liu, Kuo-Ching; Cohen, Martin G.
CS Excel/Quantronix, Hauppauge, NY, 11788, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1994), 2087(13TH ANNUAL SYMPOSIUM ON PHOTOMASK TECHNOLOGY AND MANAGEMENT, 1993), 258-67
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

AB Results of a study to develop methods based on UV **laser ablation** and chem. etching, for repairing defects in phase shifting **masks** are discussed. The application of these techniques to a variety of candidate phase shifting **mask** types including std. and attenuating Cr types is discussed. The repair methods are characterized in terms of process **laser** wavelength and energy flux, precursor gas type and material removal rate, transmission in the repaired area, and the phase shift, if any, introduced at the repair site. The effectiveness of various optical and gas delivery techniques are compared with the types of defects likely to be encountered in the candidate **masks**. The results presented include repair rate, etching uniformity and transmission data along with SEM and optical micrographs before and after repair events. Results from expts. to develop a deposition process for SiO2 films are also be presented. UV **photolytic** processes with silicon dioxide precursors such as phenylsilanes, vinyl silanes and siloxanes with ozone as a co-reactant gas are explored. The deposited films are characterized by their index and transmission.

ST **laser** defect repair phase shifting **photomask**

IT Etching
  Laser radiation
  Photomasks
 Vapor deposition processes
   (defect repair in phase-shifting **masks** by **laser**
   -induced chromium **ablation**, quartz etching and silica
   deposition)
IT 7440-47-3, Chromium, processes
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PROC (Process); USES (Uses)
   (defect repair in phase-shifting **masks** by **laser**
   -induced chromium **ablation**, quartz etching and silica
   deposition)
IT 7631-86-9P, Silica, processes
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic
 preparation); PREP (Preparation); PROC (Process)
   (defect repair in phase-shifting **masks** by **laser**
   -induced chromium **ablation**, quartz etching and silica
   deposition)
IT 78-08-0, Triethoxyvinylsilane 1067-43-2, Tetraallyloxysilane
 13170-23-5, Di-tert-butoxydiacetoxysilane
 RL: RCT (Reactant); RACT (Reactant or reagent)
   (defect repair in phase-shifting **masks** by **laser**
   -induced chromium **ablation**, quartz etching and silica
   deposition)

L8 ANSWER 162 OF 200 CAPLUS
AN 1994:617438 CAPLUS
DN 121:217438
TI PSM defect repair using currently available tools
AU Remling, Roswitha
CS Intel Corp., Santa Clara, CA, 95052, USA
SO Proceedings of SPIE-The International Society for Optical Engineering
 (1994), 2087(13TH ANNUAL SYMPOSIUM ON PHOTOMASK TECHNOLOGY AND MANAGEMENT,
 1993), 248-57
 CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
AB The prodn. of defect-free phase shifting **masks** (PSM) that have
 proven to increase resoln. in optical lithog. still remains a challenge.
 The increase in resoln. not only reduces the max. allowed chromium defect
 size, but also introduces phase defects that print at even smaller sizes
 than conventional defects. Typical defects on quartz etched Rim shifting
 and Attenuated PSMs as well as the min. requirements for repairing these
 defects during the process development phase are discussed. PSM repair
 methods using conventional **mask** repair techniques such as
 focused ion beam sputtering and **laser ablation** are
 also discussed.
ST phase shifting **mask** repair 2314 3124
IT **Laser** radiation
   (**ablation** by; defect repair of phase shifting **masks**
   using focused ion beam sputtering and by **laser**
   ablation)
IT **Photomasks**
   (defect repair of phase shifting **masks** using focused ion beam
   sputtering and by **laser ablation**)
IT Sputtering
   (ion-beam, defect repair of phase shifting **masks** using
   focused ion beam sputtering and by **laser ablation**)
IT Lithography
   (**photo-**, defect repair of phase shifting **masks**
   using focused ion beam sputtering and by **laser**
   ablation)

IT 7440-47-3, Chromium, uses
RL: DEV (Device component use); USES (Uses)
(defect repair of phase shifting **masks** using focused ion beam sputtering and by **laser ablation**)

L8 ANSWER 163 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:592529 CAPLUS
DN 121:192529
TI Small diameter dry etched via holes in GaAs
AU Pearton, S. J.; Ren, F.; Katz, A.; Tseng, B.; Lothian, J. R.; Fullowan, T. R.
CS At and T Bell Lab., Murray Hill, NJ, 07974, USA
SO Materials Research Society Symposium Proceedings (1993), 300(III-V Electronic and Photonic Device Fabrication and Performance), 153-9
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal
LA English
CC 76-2 (Electric Phenomena)
AB Two techniques for fabricating through-wafer via holes in 2-4 mil thick GaAs substrates were examd. In the first, Ni or thick **photoresist masks** were used for patterning 30 .mu.m diam. vias by ECR radio-frequency dry etching using low pressure (10-20 mTorr), low bias (-150 V) BCl3/Cl2 discharges. Microwave enhancement of these discharges produced faster etch rates but a greater degree of isotropic material removal at a given pressure. Reducing the process pressure produces extremely anisotropic features with high aspect ratio. The BCl3-to-Cl2 ratio must be kept to .gtoreq.5:1 to maintain the anisotropy. A novel **laser** drilling technique was also examd.; in this case, a Q-switched beam with high energy d. was used to **ablate** material in each pass of the beam, producing a via in approx. 40 passes. This is a **maskless** procedure capable of producing any desire via hole pattern, but currently there is no selectivity for **ablating** GaAs over a front-side metal film.
ST gallium arsenide dry etching via hole
IT Electric conductors
(interconnections, small diam. dry etched via holes in GaAs)
IT 1303-00-0, Gallium arsenide, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(small diam. dry etched via holes in GaAs)

L8 ANSWER 164 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:546333 CAPLUS
DN 121:146333
TI Production of crossovers and vias of superconducting lines in the YBa2Cu3O7-x/isolator/YBa2Cu3O7-x system
AU Strikovski, M.; Schubert, J.; Ockenfuss, G.; Woerdenweber, R.; Gassig, U.; Zander, W.
CS Institut fur Schicht- und Ionentechnik (ISI), Julich, D-52428, Germany
SO Appl. Supercond., [Pap. Eur. Conf.], 1st (1993), Volume 1, 651-4.
Editor(s): Freyhardt, H. C. Publisher: DGM Informationsges., Oberursel, Germany.
CODEN: 60CZAR
DT Conference
LA English
CC 76-4 (Electric Phenomena)
AB Trilayered HTSC electronic devices include basic passive elements as current carrying lines, their insulating crossings and superconducting contacts on limited area. Epitaxial trilayer of YBa2Cu3O7-x (YBCO) films with intermediate insulator (SrTiO3 or LaAlO3) had been grown successfully. At the same time the difficulties arise in obtaining of insulated and of high-jc top YBOC layer over the bottom patterned YBCO strip. Defects as sharp edge steps, amorphization of surface, rest of **masking** material appear during the strip patterning with std. **photolithog**. and ion milling process. The results in breaking of the in-plane orientation of the overlayer on the edge of the strip (or in

appearing of weak superconducting barrier) and in small crit. c.d. of crossover. The authors report some new technol. approaches in this problem. The authors produced with them crossovers and vias of superconducting lines in YBCO/insulator/YBCO system and also made the 12-turn flux transformer for HTSC SQUIDs. Each layer in the authors' multiturn transformer and in test elements of crossings and vias was grown with pulsed **laser** deposition. To make insulated YBCO layers, the bottom layer was produced with a cross-fluxes **laser** deposition system allowing one to exclude droplets on the YBCO film to reduce pinholes and thickness in the next insulating SrTiO3 (STO) layer. The authors have developed a film shadow **mask** technique to deposit and to produce in-situ the pattern of the bottom YBCO level.

ST trilayered superconducting electronic device crossover; yttrium barium cuprate strontium titanate; multiturn flux transformer SQUID **laser ablation**; calcia zirconia shadow **mask** superconductor device

IT Superconductor devices
(fabrication of trilayered)

IT Transformers
(flux, for SQUIDs for trilayered superconducting electronic devices)

IT Epitaxy
(of yttrium barium cuprate superconductor on strontium titanate for trilayered superconducting electronic devices)

IT **Ablation**
(**laser**-induced, prepn. of flux transformer by, for SQUIDs for trilayered superconducting electronic devices)

IT Superconductor devices
(quantum interference, trilayered superconducting electronic)

IT 12795-57-2, Strontium titanium oxide 109064-29-1D, Yttrium barium copper oxide (yba2cu3o7), oxygen-deficient
RL: PRP (Properties)
(fabrication of trilayered electronic devices contg.)

IT 1314-23-4, Zirconia, uses
RL: DEV (Device component use); USES (Uses)
(**mask** of, with calcia, for fabrication of trilayered superconducting electronic devices)

IT 1305-78-8, Calcia, uses
RL: DEV (Device component use); USES (Uses)
(**mask** of, with zirconia, for fabrication of trilayered superconducting electronic devices)

L8 ANSWER 165 OF 200 CAPLUS
AN 1994:311210 CAPLUS
DN 120:311210
TI **Laser** or flood exposure generated electrically conducting patterns in polymers
AU Bargon, Joachim; Baumann, Reinhard
CS Inst. Phys. Chem., Univ. Bonn, BONN, D-W-5300, Germany
SO Materials Research Society Symposium Proceedings (1992), 274(Submicron Multiphase Materials), 47-52
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
AB Elec. conducting patterns can be generated in insulating polymers or composites either via UV-flood exposure through a **mask** or via **laser** irradn. Various lithog. concepts starting either from conventional or custom tailored polymers or from special composites have been developed and tested. Thereby elec. conducting polymers are **photogenerated** either directly from a self-developing **photosensitive** precursor or via a two-component redox approach using one of the components as a vapor in an otherwise dry process. The elec. conducting patterns so obtained may be reinforced by plating them

with metals electrogalvanically. These processes may also be combined
with **laser** induced **ablation**, whereby the intensity of
the **laser** beam may be gated to either induce elec. cond. of the
substrate or to **ablate** it without rendering it conductive.
Analogously, thin films of elec. conducting polymers on top of insulating
polymer layers can be patterned directly using excimer **laser**
ablation.

ST lithog **photoinduced** elec conducting pattern polymer
IT Resists
(**laser** or flood exposure generated elec. conducting patterns
in)
IT Electric circuits
(integrated, lithog. fabrication of, **laser** or flood exposure
generated elec. conducting patterns in resist layers for)
IT 7758-94-3P, Iron dichloride
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in lithog. **photoinduced** generation of elec.
conducting patterns on poly(vinyl chloride) contg. iron trichloride)
IT 109-97-7, Pyrrole
RL: USES (Uses)
(in lithog. **photoinduced** generation of elec. conducting
patterns in polymer resist coatings)
IT 110-02-1, Thiophene
RL: USES (Uses)
(in lithog. **photoinduced** generation of elec. conducting
patterns on polymer resist using)
IT 7705-08-0, Iron trichloride, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(lithog. **photoinduced** generation of elec. conducting patterns
on poly(vinyl chloride) contg.)
IT 93975-08-7, Poly(bis-ethylthioacetylene) 120621-18-3,
3-Dodecyloxythiophene
RL: USES (Uses)
(lithog. **photoinduced** generation of elec. conducting patterns
on polymer resist contg.)
IT 9010-98-4P, Polychloroprene 9022-52-0P, Poly(chlorostyrene)
51160-35-1P, Poly(chloroacrylonitrile)
RL: PREP (Preparation)
(lithog. **photoinduced** generation of elec. conducting patterns
on resist coatings using)
IT 9002-86-2P, Poly(vinyl chloride)
RL: PREP (Preparation)
(lithog. **photoinduced** generation of elec. conducting patterns
on resist layer of)

L8 ANSWER 166 OF 200 CAPLUS
AN 1994:258744 CAPLUS
DN 120:258744
TI Preparation of bicrystal substrates and properties of YBaCuO grain
boundary junctions
AU Wang, Shiguang; Dai, Yuandong; Zeng, Xianghui; Zheng, Peihui; Wang,
Zhiguang; Xiong, Guangcheng; Lian, Guijun; Li, Jie; Gan, Zizao
CS Dep. Phys., Peking Univ., Beijing, 100871, Peop. Rep. China
SO Diwen Wuli Xuebao (1993), 15(4), 245-50
CODEN: DWXUES; ISSN: 1000-3258
DT Journal
LA Chinese
CC 76-4 (Electric Phenomena)
AB Using a simple sintering technique, the authors have bounded the
yttria-stabilized-zirconia bicrystal with engineered (100) axes
misorientation. YBaCuO thin films are deposited by KrF **laser**
ablation and junctions are patterned by ion beam etching with
conventional **photoresist mask**. The properties of the
grain-boundary-junctions (GBJs) are detd. by the titled angle of the
bicrystal. The resistive transition of the junctions are compared with

the thermally activated phase slippage mechanism and excellent agreement
is found.

ST bicrystal substrate grain boundary superconductor junction; barium copper yttrium oxide superconductor junction; yttria stabilized zirconia bicrystal substrate

IT Superconductor devices
(junctions, grain-boundary, barium copper yttrium oxide, prepn. of yttria-stabilized-zirconia bicrystal as substrates for)

IT 1314-23-4, Zirconia, uses
RL: USES (Uses)
(bicrystal substrates from yttria-stabilized, for barium copper yttrium oxide grain boundary junctions)

IT 107539-20-8, Barium copper yttrium oxide
RL: PRP (Properties)
(grain boundary junctions from, prepn. of yttria-stabilized-zirconia bicrystal substrates for)

IT 1314-36-9, Yttria, uses
RL: USES (Uses)
(zirconia substrates stabilized with, for barium copper yttrium oxide grain boundary junctions)

L8 ANSWER 167 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1994:251381 CAPLUS

DN 120:251381

TI **Ablation**, surface activation, and electroless metalization of insulating materials by pulsed excimer **laser** radiation

AU Lowndes, Douglas H.; Godbole, M. J.; Jellison, G. E., Jr.; Pedraza, A. J.

CS Oak Ridge Natl. Lab., Oak Ridge, TN, 37831-6056, USA

SO AIP Conference Proceedings (1993), 288(Laser Ablation: Mechanisms and Applications--II), 321-8
CODEN: APCPCS; ISSN: 0094-243X

DT Journal

LA English

CC 57-2 (Ceramics)
Section cross-reference(s): 56, 76

AB Pulsed-**laser** irradn. of wide bandgap ceramic substrates, using **photons** with sub-bandgap energies, activates the ceramic surface for subsequent electroless Cu deposition. The Cu deposit is confined within the irradiated region when the substrates are subsequently immersed in an electroless Cu bath. However, a high **laser** fluence (typically several J/cm2) and repeated **laser** shots are needed to obtain uniform Cu coverage by this direct-irradn. process. In contrast, by first applying an evapd. SiOx thin film (with x .apprx. 1), **laser ablation** at quite low energy d. (.apprx.0.5 J/cm2) results in redeposition on the ceramic substrate of material that is catalytic for subsequent electroless Cu deposition. Expts. indicate that the redeposited material is Si, on which Cu nucleates. Using an SiOx film on a **laser**-transparent substrate, quite fine (.apprx.12 .mu.m) Cu lines are formed at the boundary of the region that is **laser** -etched in SiOx. Using SiOx with an absorbing (polycryst.) ceramic substrate, more-or-less uniform activation and subsequent Cu deposition are obtained. In the latter case, interactions with the ceramic substrate may also be important for uniform deposition.

ST excimer **laser** radiation activation ceramic; electroless metalization ceramic activation; alumina ceramic irradn excimer **laser**; sapphire irradn excimer **laser**; aluminum nitride irradn excimer **laser**; silica vapor deposition ceramic; copper electroless metalization ceramic

IT Electric insulators and Dielectrics
(**masking** of, by vapor deposition of silicon oxide, for surface activation with excimer **laser** and nucleation in electroless metalization with copper)

IT Coating process
(electroless, of elec. insulators, with copper, **masking** with silica by vapor deposition and irradn. with excimer **laser**

for, activation and copper nucleation)
IT Lasers
(excimer, irradn. with, of silica-**masked** surface of elec. insulators, for activation and nucleation in copper deposition by electroless metalization)
IT 7440-21-3, Silicon, uses
RL: USES (Uses)
(**masking** of, by vapor deposition of silicon oxide, for surface activation with excimer **laser** and nucleation in electroless metalization with copper)
IT 7631-86-9, Silica, uses
RL: USES (Uses)
(**masking** with, of elec. insulator materials, by vapor deposition, for surface activation with excimer **laser** and nucleation in electroless metalization with copper)
IT 7440-50-8, Copper, uses
RL: USES (Uses)
(metalization with, of elec. insulators, **masking** with silicon oxide by vapor deposition for, for activation by **laser** radiation)

L8 ANSWER 168 OF 200 CAPLUS
AN 1994:207452 CAPLUS
DN 120:207452
TI Ultraviolet **laser**-projection patterning of polymeric materials for electrochemical gas sensors
AU Tejedor, P.; Briones, F.
CS Cent. Nac. Microelectron., Madrid, 28006, Spain
SO Applied Physics Letters (1994), 64(7), 936-8
CODEN: APPLAB; ISSN: 0003-6951
DT Journal
LA English
CC 79-2 (Inorganic Analytical Chemistry)
Section cross-reference(s): 38, 74, 80
AB ArF **laser ablation** was successfully applied to **maskless** pattern by projection lithog. of 2 polymeric materials, polysiloxane and polyHEMA [poly(2-hydroxyethyl methacrylate)], to be used as gas diffusion membranes in electrochem. gas sensors. Etch rates up to 0.65 .mu.m/s with smooth surface morphol., high edge definition, and a resoln. of .apprx.5 .mu.m were obtained using **laser** fluences between 250 and 400 mJ/cm2 and repetition rates between 1 and 10 Hz in air for poly-HEMA films and in nitrogen for polysiloxane films.
ST UV **laser** projection polymer patterning; electrochem gas sensor polymer patterning; lithog polymer patterning; diffusion membrane polymer patterning; **photoablative laser** induced etching
IT Polymers, uses
Siloxanes and Silicones, uses
RL: ANST (Analytical study)
(for electrochem. gas sensors, UV **laser**-projection patterning of)
IT Lithography
(patterning of polymeric materials for electrochem. gas sensors by)
IT Gas analysis
(sensors for, UV **laser**-projection patterning of polymeric materials for)
IT Sensors
(gas, electrochem., UV **laser**-projection patterning of polymeric materials for)
IT **Ablation**
(**laser**-induced, patterning of polymers for electrochem. gas sensors by)
IT 25249-16-5, Poly(2-hydroxyethyl methacrylate)
RL: ANST (Analytical study)
(for electrochem. gas sensors, UV **laser**-projection patterning of)

L8 ANSWER 169 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:180223 CAPLUS
DN 120:180223
TI Rework of polymeric dielectric electrical interconnect by **laser photoablation**
IN Pan, Ju Don T.
PA Microelectronics and Computer Technology Corp., USA
SO U.S., 7 pp. Cont.-in-part of U.S. Ser. No. 822,257, abandoned.
CODEN: USXXAM
DT Patent
LA English
IC ICM H01L021-306
ICS H01L021-26
NCL 156643000
CC 76-2 (Electric Phenomena)
Section cross-reference(s): 38, 56, 73
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5236551	A	19930817	US 1992-972665	19921106
PRAI	US 1990-521790		19900510		
	US 1992-822257		19920117		

AB A metal/polymeric dielec. substrate has metal conductors selectively disconnected by **photoablating** the polymeric dielec. with an excimer **laser**, etching the exposed metal using the polymeric dielec. as a **mask**, and coating an addnl. layer of polymeric dielec., thus eliminating the need for depositing and removing a sep. **photoablatable mask**. Siloxane-modified polyimide is a preferred **photoablatable** polymeric material and Cu is a preferred metal.
ST polymeric dielec elec interconnect rework; **laser photoablation** elec interconnect rework
IT Epoxy resins, uses
RL: USES (Uses)
(dielecs., rework of elec. interconnects of, by **laser photoablation**)
IT Electric insulators and Dielectrics
(polymeric, elec. interconnects, rework of, by **laser photoablation**)
IT Polyimides, uses
RL: USES (Uses)
(siloxane-modified, dielecs., rework of elec. interconnects of, by **laser photoablation**)
IT Electric conductors
(interconnections, rework of, by **ablation**)
IT **Ablation**
(light-induced, **laser**, for rework of polymeric dielec. elec. interconnects)
IT 694-87-1D, Benzocyclobutane, polymers
RL: USES (Uses)
(dielecs., rework of elec. interconnects of, by **laser photoablation**)
IT 7429-90-5, Aluminum, uses 7440-33-7, Tungsten, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses
RL: USES (Uses)
(disconnection of, in elec. interconnects, by **laser photoablation**)

L8 ANSWER 170 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:179355 CAPLUS
DN 120:179355
TI Micropatterning of quartz substrates by multi-wavelength vacuum-ultraviolet **laser ablation**
AU Sugioka, Koji; Wada, Satoshi; Tsunemi, Akira; Sakai, Toshiaki; Takai,

Hiroshi; Moriwaki, Hiroki; Nakamura, Akira; Tashiro, Hideo; Toyoda, Koichi
CS Inst. Phys. Chem. Res., Wako, 351-01, Japan
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (1993), 32(12B), 6185-9
CODEN: JAPNDE; ISSN: 0021-4922
DT Journal
LA English
CC 76-3 (Electric Phenomena)
AB **Photoablation** of synthetic fused quartz by simultaneous irradn. of multi-wavelength beams of a vacuum-UV (VUV) **laser** using high-order anti-Stokes Raman scattering is described. The VUV **laser**, which emits widely spread Raman-shifted lines from 133 to 594 nm, is ideal for effective **laser ablation** of the fused quartz. Well-defined patterns with a cross-sectional profile of a rectangular shape are formed by using a contact **mask** at an **ablation** rate as high as 13 nm/s. An effective absorption coeff. of 3.5 .times. 10-5 cm-1, which indicates that the multi-wavelength irradn. plays an important role in the process, is obtained.
ST quartz **laser ablation** multiwavelength vacuum UV
IT **Ablation**
(**laser**-induced, of quartz, with multi-wavelength vacuum-UV source)
IT 14808-60-7, Quartz, uses
RL: USES (Uses)
(micropatterning of, by multi-wavelength vacuum-UV **laser ablation**)

L8 ANSWER 171 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1994:19008 CAPLUS
DN 120:19008
TI Direct patterning by **laser ablation** of quartz substrates by **laser ablation** using VUV anti-Stokes Raman pulses
AU Sugioka, K.; Wada, S.; Tashiro, H.; Yotoda, K.; Sakai, T.; Takai, H.; Moriwaki, H.; Nakamura, A.
CS Inst. Phys. Chem. Res., Wako, 351-01, Japan
SO Materials Research Society Symposium Proceedings (1993), 285(Laser Ablation in Materials Processing), 225-30
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
AB High speed microfabrication of quartz substrates by **laser ablation**, using vacuum-UV (VUV) **laser** beams is described. The VUV light is generated by anti-Stokes stimulated Raman scattering of fourth harmonics of Q-switched Nd:YAG **laser**. The well-defined patterns with a cross-section profile of rectangular shape are formed by using a contact **mask**. The role of short wavelength components of the VUV **laser** beams in the process is discussed.
ST quartz direct microimaging **laser ablation**; **photoablation** quartz substrate microfabrication vacuum UV
IT Lithography
(direct-write, in microfabrication of quartz substrates by **laser ablation** using vacuum-UV)
IT **Ablation**
(light-induced, microfabrication of quartz substrates by, using vacuum-UV **laser** beams)
IT 14808-60-7, Quartz, properties
RL: PRP (Properties)
(microfabrication of substrates of, by **laser ablation** using vacuum-UV)

L8 ANSWER 172 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1993:614059 CAPLUS
DN 119:214059
TI **Ablation**-transfer imaging/recording
IN Foley, Diane M.; Bennett, Everett W.; Slifkin, Sam C.
PA Graphics Technology International, Inc., USA
SO U.S., 16 pp. Cont.-in-part of U.S. Ser. No. 497,648, abandoned.
CODEN: USXXAM
DT Patent
LA English
IC ICM G03C008-02
ICS G03C008-44
NCL 430200000
CC 74-7 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5156938	A	19921020	US 1991-706775	19910529
	CA 2049362	AA	19901001	CA 1990-2049362	19900330
	CA 2049362	C	20010703		
	US 5501938	A	19960326	US 1994-181191	19940113
	AU 9479038	A1	19950223	AU 1994-79038	19941125
	AU 682224	B2	19970925		
	US 6537720	B1	20030325	US 1996-739157	19961030
PRAI	US 1989-330497	B2	19890330		
	US 1990-497648	B2	19900323		
	US 1990-592790	B2	19901004		
	US 1991-706775	A3	19910529		
	US 1991-707039	A3	19910529		
	US 1992-841488	B1	19920226		
	US 1992-841489	A1	19920226		
	US 1993-61037	B1	19930514		
	US 1994-193767	B1	19940209		
	US 1995-525039	B1	19950908		

AB In a unique method/system for simultaneously creating and transferring a contrasting pattern of intelligence on and from an **ablation** -transfer imaging medium to a receptor element in contiguous registration therewith not dependent upon a contrast imaging material that must absorb the imaging radiation and is well adopted for such applications as, e.g., color proofing and printing, the security coding of various documents and the prodn. of **masks** for the graphic arts and printed circuit industries, the **ablation**-transfer imaging medium comprises a support substrate and an imaging radiation-**ablative** topcoat essentially coextensive therewith, such **ablative** topcoat having a non-imaging **ablation** sensitizer and an imaging amt. of a non-**ablation** sensitizing contrast imaging material contained therein.
ST **ablation** transfer **laser** image recording
IT Printing, impact
(color proofing in, **laser ablation**-transfer imaging materials contg. polyurethanes and dyes for)
IT Urethane polymers, uses
RL: USES (Uses)
(**laser ablation**-transfer recording materials contg. dyes and)
IT **Photomasks**
(**laser ablation**-transfer recording materials contg. polyurethanes and dyes for prepn. of)
IT Electric circuits
(integrated, **laser ablation**-transfer imaging materials contg. polyurethanes and dyes for manuf. of)
IT Printing, nonimpact
(thermal-transfer, **laser ablation** materials contg. polyurethanes and dyes for)
IT 80-05-7D, polycarbonate derivs. 110-03-2D, polycarbonate derivs. 142-30-3D, polycarbonate derivs. 31630-50-9 134621-85-5 134621-86-6

134621-87-7   134621-88-8   134621-89-9   134621-90-2   134621-91-3
142007-19-0   150775-28-3   150775-29-4   150775-30-7   150775-31-8
150871-84-4   150871-87-7   150871-90-2
RL: USES (Uses)
(**laser ablation**-transfer recording materials contg. dyes and)

IT 142-30-3, 2,5-Dimethyl-3-hexyne-2,5-diol 5496-71-9, Cyasorb IR 165 68155-92-0, Morfast blue 100 94765-86-3, Morfast red 104 112099-32-8, Morfast yellow 101 134910-54-6, Morfast brown 100 134910-75-1, Morfast blue 105 150872-67-6, Morfast Violet 1001
RL: USES (Uses)
(**laser ablation**-transfer recording materials contg. polyurethanes and)

L8 ANSWER 173 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1993:571630 CAPLUS
DN 119:171630
TI Dielectric mirror **mask** for **laser ablation** in fabrication of multilayer interconnections in circuit boards
IN Yamagishi, Yasuo; Shiba, Shoji
PA Fujitsu Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM B23K026-00
ICS B23K026-06; H05K003-00; H05K003-46
ICI B23K101-42
CC 76-2 (Electric Phenomena)
Section cross-reference(s): 73
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04356388	A2	19921210	JP 1991-121533	19910528
PRAI	JP 1991-121533		19910528		

AB The title **laser ablation** method is characterized by the use of a dielec. mirror **mask** formed on a substrate by **photolithog**. patterning process.
ST **laser ablation** dielec mirror **mask**; multilayer interconnection **laser ablation**
IT **Photomasks**
(dielec. mirror, for **laser ablation**)
IT Electric conductors
(interconnections, multilayer, fabrication of, by **laser ablation** using dielec. mirror **masks**)
IT **Ablation**
(**laser**-induced, dielec. mirror **masks**, for making multilayer interconnections)

L8 ANSWER 174 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1993:235400 CAPLUS
DN 118:235400
TI Single-shot micro-patterning of polymer surfaces by UV incubation/dye **laser ablation** using **photochromism**
AU Preuss, S.; Stuke, M.
CS Max-Planck-Institut fuer biophysikalische Chemie, P.O. Box 2841, Gottingen, 3400, Germany
SO Applied Surface Science (1993), 69(1-4), 253-7
CODEN: ASUSEE; ISSN: 0169-4332
DT Journal
LA English
CC 38-3 (Plastics Fabrication and Uses)
AB The optical absorption of subsurface polymer material can increase by low intensity UV irradn. (incubation) with spatial control using a suitable contact **mask**. Spatially selective **ablation** can then

be achieved with large area pulses at a wavelength at which not the virgin but the modified material absorbs the **laser** light. With this 2-step process, micron or even submicron patterns can be obtained in a simple way. By doping polymers with **photochromic** compds. the efficiency of this process is improved drastically. The no. of required pulses reduces to the min., i.e., micron-sized structures can be generated on various polymer surfaces with a single pulse for incubation and **ablation**, resp.

ST **ablation** patterning plastic film **photochromism**

IT **Photochromic** substances
(**ablative** micropatterning of poly(Me methacrylate) contg., by UV irradn.)

IT **Ablation**
(micropatterning of PMMA by, using UV irradn., **photochromic** substances for)

IT Surface
(micropatterning of, of PMMA, by UV irradn. **ablation**, **photochromic** substances for)

IT 1498-88-0
RL: USES (Uses)
(**ablative** micropatterning of poly(Me methacrylate) contg., by UV irradn.)

IT 9011-14-7, PMMA
RL: USES (Uses)
(**ablative** micropatterning of, by UV radiation, **photochromic** substances for)

L8 ANSWER 175 OF 200 CAPLUS

AN 1993:112798 CAPLUS

DN 118:112798

TI X-ray **mask** development based on silicon carbide membrane and tungsten absorber

AU Chaker, M.; Boily, S.; Diawara, Y.; El Khakani, M. A.; Gat, E.; Jean, A.; Lafontaine, H.; Pepin, H.; Voyer, J.; et al.

CS INRS-Energ., Varennes, QC, J3X 1S2, Can.

SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1992), 10(6), 3191-5
CODEN: JVTBD9; ISSN: 0734-211X

DT Journal

LA English

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB A detailed description is provided of x-ray **mask** technol. based on SiC membrane and W absorber. Amorphous SiC films were prepd. using either a 100 kHz plasma-enhanced CVD (PECVD) system (allowing a high throughput) or a **laser ablation** deposition (LAD) technique. The PECVD a-SixC1-x:H films have a max. Si-C bond d. at x = 0.5, a H content of 27 at.% and a high-compressive stress (1 GPa). The LAD films are stoichiometric, H-free, and under high-compressive stress (1.4 GPa). To achieve the tensile stress range (20-40 MPa) required for membrane fabrication, a well-controlled rapid thermal annealing (RTA) process was developed. At 633 nm, the resulting PECVD and LAD membranes have an optical transparency of 75% and 40%, resp., and their corresponding biaxial Young's moduli are 250 .+-. 30 and 360 .+-. 60 GPa. A novel approach using RTA for fine tuning of the W stress is also proposed. Low stress (<10 MPa) is obtained for W layers initially under compressive stress <300 MPa. Finally, using an electron-beam patterning process based on a single resist layer and reactive ion etching for the pattern transfer, x-ray **masks** with linewidths down to 100 nm were developed.

ST x ray **mask** silicon carbide tungsten; lithog **photomask** silicon carbide tungsten

IT **Photomasks**
(x-ray, based on silicon carbide membrane and tungsten absorber)

IT 409-21-2, Silicon carbide, uses

RL: USES (Uses)
(deposition and characteristics of membrane from, for lithog. x-ray **mask** with tungsten absorber)

IT 1333-74-0, Hydrogen, uses
RL: USES (Uses)
(deposition and characteristics of silicon carbide membrane contg., for lithog. x-ray **mask** with tungsten absorber)

IT 7440-33-7, Tungsten, uses
RL: USES (Uses)
(lithog. x-ray **mask** with silicon carbide membrane and absorber layer of)

IT 75-46-7, Trifluoromethane 2551-62-4, Sulfur hexafluoride
RL: USES (Uses)
(reactive ion etching with gas mixt. contg., in fabrication of lithog. x-ray **masks** with silicon carbide membrane and tungsten absorber)

L8 ANSWER 176 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1992:661446 CAPLUS
DN 117:261446
TI Excimer **laser** projector for materials processing applications
AU Gower, M. C.; Rumsby, P. T.
CS Excitech Ltd., Long Hanborough/Oxford, OX8 8LH, UK
SO European Materials Research Society Monographs (1992), 4(Laser Ablation Electron. Mater.), 255-62
CODEN: EMRMEH; ISSN: 0927-5010
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
AB Fully integrated excimer **laser mask** macro and microprojectors and application workstations that produce on the workpiece illumination uniformities as low as .+-.5% with overall energy throughput efficiencies of up to 70% are described.
ST excimer **laser** projector **photomask** microelectronics manufg
IT Projection apparatus
(macro and micro, for excimer lasers, in microelectronics applications)
IT **Photomasks**
(UV, excimer **laser** projector for, in microelectronics)
IT Lasers
(excimer, projector for, in microelectronics manufg.)
IT **Ablation**
(**laser**-induced, app., excimer **laser** projector)
IT Machining
(micro-, excimer **laser** projector for)

L8 ANSWER 177 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1992:522526 CAPLUS
DN 117:122526
TI Microstructure of edge-type Josephson junctions with praseodymium barium copper oxide (PrBa2Cu3O7-x) barrier layer
AU Lebedev, O. I.; Vasil'ev, A. L.; Kiselev, N. A.; Mazo, L. A.; Gaponov, S. V.; Pavel'ev, D. G.; Strikovskii, M. D.
CS Inst. Crystallogr., Moscow, 117333, Russia
SO Physica C: Superconductivity and Its Applications (Amsterdam, Netherlands) (1992), 198(3-4), 278-86
CODEN: PHYCE6; ISSN: 0921-4534
DT Journal
LA English
CC 76-4 (Electric Phenomena)
Section cross-reference(s): 66
AB High-resoln. electron microscopy investigations of edge Josephson junctions (EJJ) with a PrBa2Cu3O7-x barrier layer (PB) were performed.

All layers (superconducting YBa2Cu3O7-x (Y1) and (Y2), insulating PrBa2Cu3O7-x (PI) and barrier (PB) were obtained by **laser ablation**. The edges were formed by ion sputtering using a **photoresist mask**. EJJ shows Josephson cond. at Tc = 77 K, giving jc = 104 A/cm2 at Uc = 50 .mu.V. Cross-sectional images show that the Y1, PI, and PB layers are single crystal with the c-axis normal to the substrate surface. The Y2 layer in the region of a multilayered structure is polycryst. The PB/Y1 interface is characterized by antiphase boundary (APB) line boundaries; it is inclined to the substrate by 20-35.degree..

ST Josephson junction praseodymium barium cuprate barrier; microstructure cuprate superconductor Josephson junction

IT Superconductor devices
(Josephson junctions, microstructure of, with praseodymium barium copper oxide barrier layer)

IT 111776-14-8D, oxygen-deficient
RL: PRP (Properties)
(microstructure of edge-type Josephson junctions with barrier layer of)

L8 ANSWER 178 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1992:480231 CAPLUS
DN 117:80231
TI **Ablation mask** and use thereof
IN Bobroff, Norman; Rosenbluth, Alan Edward
PA International Business Machines Corp., USA
SO Eur. Pat. Appl., 15 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM G03F001-14
ICS H01L021-308
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 463319	A1	19920102	EP 1991-106877	19910427
	R: DE, FR, GB				
	JP 04233542	A2	19920821	JP 1991-103709	19910314
PRAI	US 1990-543243		19900625		

AB An **ablation mask** that includes a transparent substrate having a patterned layer located between 2 dielec. transparent material coatings thereon is provided. The **ablation mask** is useful in dry etching processes to provide patterned layers and other **laser** processing applications that require high fluence such as **photodeposition**, thin-film transfer, and thin-film release.

ST **ablation mask** dielec layer transparent

IT Electric insulators and Dielectrics
(**ablation mask** patterns sandwiched between layers of transparent)

IT **Photomasks**
(**ablation**, with opaque patterns sandwiched between transparent dielec. layers)

IT 1314-20-1, Thoria, uses 1314-61-0, Tantalum pentoxide 1344-28-1, Alumina, properties 7631-86-9, Silica, uses 7783-40-6, Magnesium fluoride (MgF2) 12055-23-1, Hafnium dioxide 12060-08-1, Scandium oxide
RL: USES (Uses)
(**ablation mask** patterns sandwiched between layers of)

L8 ANSWER 179 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1992:265293 CAPLUS
DN 116:265293
TI Phosphor **mask** for **laser ablation**
AU Anon.

CS USA
SO Research Disclosure (1992), 335, 214
CODEN: RSDSBB; ISSN: 0374-4353
DT Journal
LA English
CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
AB Phosphor a **mask** is proposed for creating a pattern of high fluence **laser** radiation for the purpose of **ablating** patterned areas of a target substrate.
ST phosphor **mask laser ablation** patterning
IT **Photomasks**
(from phosphors, for **laser ablative** patterning)
IT Phosphors
(**mask** from, for **laser ablative** patterning)
IT **Laser** radiation
(phosphor mass for **ablation** patterning by)
IT **Ablation**
(**laser**-induced, phosphor mass for patterning by)

L8 ANSWER 180 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1992:224511 CAPLUS
DN 116:224511
TI **Mask** for **laser ablation**
AU Anon.
CS UK
SO Research Disclosure (1992), 336, 277
CODEN: RSDSBB; ISSN: 0374-4353
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB A **mask** for **laser ablation** is described which has the advantages of low cost and repairability and is aimed primarily at the area of low-vol., early user hardware. **Laser ablation** processes cannot use conventional chrome/quartz **masks** because the chromium absorbs a substantial fraction of the incident energy, instantaneously converts it to heat, and rapid pulsing of the **laser** increases the metal temp. and destroys it. The **mask** is built on a quartz substrate and the opaque areas are formed from a 2-layer film. The metal layer closest to the quartz is vacuum-deposited Al of .apprx.0.1 .mu.m (.mu.m) thickness. The quartz/Al interface has a reflectivity of >90% for most **laser** wavelengths of interest. The second layer, above the Al, is a 3-5 .mu.m layer of Cu. Its purpose is to conduct any absorbed energy rapidly away from the quartz/Al interface to prevent its thermal degrdn. Patterning of the layers is done by a combination of wet etching and ion milling, using lithog. **masks**.
ST lithog **laser ablation mask**
IT **Photomasks**
(for **laser ablation**, contg. quartz substrate with copper sublayer and aluminum layer)
IT Lithography
(**mask** for **laser ablation** in)
IT **Ablation**
(**laser**-induced, **mask** for)
IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses
RL: USES (Uses)
(lithog. **mask** for **laser ablation** contg. layer of)
IT 14808-60-7, Quartz, uses
RL: USES (Uses)
(lithog. **mask** for **laser ablation** contg.

layer of copper and layer of aluminum on substrate of)

L8 ANSWER 181 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1992:72072 CAPLUS
DN 116:72072
TI Silicon carbide membranes for x-ray **masks** produced by **laser ablation** deposition
AU Boily, S.; Chaker, M.; Pepin, H.; Kerdja, T.; Voyer, J.; Jean, A.; Kieffer, J. C.; Leung, P.; Cerrina, F.; Wells, G.
CS INRS-Energ., Varennes, QC, J3X 1S2, Can.
SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1991), 9(6), 3254-7
CODEN: JVTBD9; ISSN: 0734-211X
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB **Laser ablation** deposition is used for the first time to fabricate SiC membranes for x-ray lithog. The process has the unique advantage of producing in a very simple manner purely stoichiometric (1:1) SiC films free of H. The variation of deposition rate with **laser** energy and intensity, the uniformity and quality of the films produced as well as an est. of the energy of the neutrals and of the ions involved in the deposition are presented. SiC membranes of 1 in. diam were successfully fabricated after anisotropic etching of the Si substrate in a KOH soln. They present an optical transparency of 40% at 633 nm.
ST silicon carbide membrane x ray lithog; **laser ablation** deposition silicon carbide
IT **Ablation**
(**laser**-induced, deposition of silicon carbide membranes for x-ray lithog. **masks** by)
IT Lithography
Photomasks
(x-ray, silicon carbide membranes for, produced by **laser ablation** deposition)
IT 7440-21-3, Silicon, uses
RL: USES (Uses)
(**laser ablation** deposition of silicon carbide membranes on substrates of, for x-ray lithog. **masks**)
IT 409-21-2, Silicon carbide, uses
RL: USES (Uses)
(lithog. x-ray **masks** with membranes from, produced by **laser ablation** deposition)

L8 ANSWER 182 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1991:593990 CAPLUS
DN 115:193990
TI Excimer **laser ablation** of Langmuir-Blodgett films
AU Magan, J.; Lupo, D.; Prass, W.; Scheunemann, U.; Lemoine, P.; Blau, W.; Hogan, M.
CS Hoechst A.-G., Frankfurt, W-6230/80, Germany
SO Makromolekulare Chemie, Macromolecular Symposia (1991), 46(Eur. Conf. Organ. Org. Thin Films, 3rd, 1990), 253-7
CODEN: MCMSES; ISSN: 0258-0322
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB **Photoablation** of several Langmuir-Blodgett (LB) films on Si substrates was performed at the excimer **laser** wavelength of 248 nm. This is a fast, solvent-free, one-step method for structuring thin org. films. Structures were produced both by projection of **mask** and also using direct writing of the **laser** beam, yielding feature sizes on the order of microns. Spectral anal. of the remaining material showed no change compared to the unexposed material, suggesting

that no degrdn. has occurred. This technique appears to be viable for use in the lithog. of LB films.

ST excimer **laser ablation** Langmuir Blodgett film; **laser** etching Langmuir Blodgett film lithog

IT Films
(Langmuir-Blodgett, excimer **laser ablation** of, micron size pattern formation using **mask** projection and direct write methods in)

IT **Ablation**
(**laser**-induced, of Langmuir-Blodgett films, pattern formation using **mask** projection and direct write method in)

IT Lithography
(**photo-**, **laser ablation** of Langmuir-Blodgett films in relation to)

IT Etching
(**photoablative**, **laser**-induced, of Langmuir-Blodgett films on silicon, pattern formation in)

IT 1506-54-3, N-Octadecylacrylamide 114041-02-0
RL: USES (Uses)
(Langmuir-Blodgett films contg., excimer **laser ablation** of, micron size pattern formation using **mask** projection and direct write method in)

L8 ANSWER 183 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1991:502649 CAPLUS
DN 115:102649
TI A thin film high damage threshold metal **laser mask**
AU Anon.
CS UK
SO Research Disclosure (1991), 326, 424
CODEN: RSDSBB; ISSN: 0374-4353
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

AB The title **mask** is made by depositing a few hundred Angstroms of Al on top of the Cu **mask** on a polymer substrate to be **laser ablated**, the Al reflecting as much as 90% of the **laser** light, whereupon the underlying thin Cu can more readily dissipate the remaining absorbed **laser** energy during **ablation**. The unwanted light is thus reflected and the Cu-to-polymer adhesion is protected.

ST copper **mask laser ablation** polymer lithog

IT **Photomasks**
(copper thin film, for **laser** oblation of polymers, aluminum coating for improved reflectance of)

IT Polymers, uses and miscellaneous
RL: USES (Uses)
(**laser ablation** patterning of, aluminum-coated copper **mask** for)

IT Lithography
(**photo-**, **laser ablation** patterning of polymers in, aluminum-coated copper **mask** for)

IT 7429-90-5, Aluminum, uses and miscellaneous
RL: USES (Uses)
(polymer **laser ablation** copper **mask** coated by, for improved reflectance)

IT 7440-50-8, Copper, uses and miscellaneous
RL: USES (Uses)
(polymer **laser ablation mask** from thin film of, with aluminum coating for improved reflectance)

L8 ANSWER 184 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1991:502630 CAPLUS

DN 115:102630
TI Excimer **laser**-assisted etching of silicon using chloropentafluoroethane
AU Russell, S. D.; Sexton, D. A.
CS Solid State Electron. Div., Nav. Ocean Syst. Cent., San Diego, CA, 92152-5000, USA
SO Materials Research Society Symposium Proceedings (1990), 158(In-Situ Patterning: Sel. Area Deposition Etching), 325-30
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
AB **Laser**-assisted **photothermal** chem. reactions have been obsd. with Si in a chloropentafluoroethane ambient using a KrF* **laser** at 248 nm. Etching occurs only if the incident fluence exceeds the melt threshold (.apprx.0.75 J/cm2, with the melt duration detd. by observing the change in Si reflectance at 633 nm. Above the **ablation** threshold (.apprx.2.2 J/cm2) increased surface roughness is obsd. Etch rates .apprx.7 .ANG./pulse have been measured using both stylus profilometer and SEM cross-sectional techniques. The etch rate dependence on incident fluence, ambient pressure, doping concn., crystal orientation and substrate temp. have been examd. suggesting an adsorption limited thermal process. This process allows single step patterning of Si devices in a non-corrosive environment.
ST lithog **maskless laser** etching silicon chloropentafluoroethane
IT Lithography
(**maskless**, excimer **laser**-assisted etching of silicon using chloropentafluoroethane in)
IT Semiconductor devices
(micro-, excimer **laser** assisted etching of silicon using chloropentafluoroethane in **maskless** lithog. in relation to fabrication of)
IT Etching
(**photochem**., **laser**-induced, of silicon using chloropentafluoroethane, in **maskless** lithog.)
IT 76-15-3
RL: USES (Uses)
(excimer **laser** assisted etching of silicon using)
IT 7440-21-3, Silicon, uses and miscellaneous
RL: RCT (Reactant); RACT (Reactant or reagent)
(excimer **laser** assisted etching of, using chloropentafluoroethane, in **maskless** lithog.)
IT 59680-94-3, Krypton fluoride
RL: USES (Uses)
(excimer **laser**, in etching of silicon using chloropentafluoroethane)

L8 ANSWER 185 OF 200 CAPLUS
AN 1991:134635 CAPLUS
DN 114:134635
TI Excimer **laser ablation** of ferrites
AU Tam, A. C.; Leung, W. P.; Krainovich, D.
CS Almaden Res. Cent., IBM Res. Div., San Jose, CA, 95120-6099, USA
SO Journal of Applied Physics (1991), 69(4), 2072-5
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English
CC 77-3 (Magnetic Phenomena)
Section cross-reference(s): 66, 73
AB **Laser** etching of ferrites was previously done by scanning a focused continuous-wave **laser** beam on a ferrite sample in a chem. environment. The phenomenon of **photo-ablation**

of Ni-Zn or Mn-Zn ferrites by pulsed 248-nm KrF excimer **laser** irradn. is studied. A transfer lens system is used to project a grating pattern of a **mask** irradiated by the pulsed KrF **laser** onto the ferrite sample. The threshold fluence for **ablation** at the ferrite surface is about 0.3 J/cm2. A typical fluence of 1 J/cm2 is used. The etched grooves produced are typically 20-50 .mu.m wide, with depths achieved as deep as 70 .mu.m. Groove straightness is good as long as a sharp image is projected onto the sample surface. The wall angle is steeper than 60 degrees. SEM of the etched area shows a "glassy" skin with extensive microcracks and solidified droplets being ejected that is frozen in action. This skin can be entirely removed by ultrasonic cleaning. A fairly efficient etching rate of about 10 nm/pulse for a patterned area of about 2 .times. 2 mm is obtained at a fluence of 1 J/cm2. This study shows that projection excimer **laser ablation** can be useful for micromachining ferrite ceramics and indicates that a hydrodynamic sputtering mechanism involving droplet emission is a cause of material removal.

ST **laser ablation** etching ferrite; manganese zinc ferrite **laser ablation**; nickel zinc ferrite **laser ablation**; zinc transition metal ferrite **laser ablation**

IT **Laser** radiation, chemical and physical effects
(**ablation** by, of nickel zinc ferrites)

IT Etching
(of nickel zinc ferrites by **laser ablation**)

IT 106389-78-0, Iron nickel zinc oxide (Fe2(Ni,Zn)O4)
RL: RCT (Reactant); RACT (Reactant or reagent)
(etching of, by **laser ablation**)

L8 ANSWER 186 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1991:91768 CAPLUS
DN 114:91768
TI Deposition, characterization, and **laser ablation** patterning of YBCO thin films
AU Vase, Per; Shen, Yueqiang; Freltoft, Torsten
CS NKT Corp. Res. Dev., Broendby, DK-2605, Den.
SO Applied Surface Science (1990), 46(1-4), 61-6
CODEN: ASUSEE; ISSN: 0169-4332
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 66, 75, 76

AB High quality epitaxial thin films of YBa2Cu3O7 were deposited on single-crystal MgO(001) substrates by 355 nm Nd:YAG **laser ablation**. Through a systematic optimization of the deposition parameters, it was found that for a target-substrate distance of 30 mm, the optimal **laser** intensity, substrate temp., and deposition O pressure were 300 MW/cm2, 750.degree., and 0.5-1.0 mbar, resp. Microstrips with dimensions down to 10 .mu.m across were fabricated using both a **photoresist** technique and **laser ablation** through a metal **mask**. The superconducting transition takes place over 1 K, and the crit. temp. is reproducible within .+-.1.5 K, the best result being Tc,0 = 90 K. The highest crit. c.d. measured on a 10 .times. 0.15 .mu.m2 strips was 4 .times. 106 A/cm2 at 77 K. Film patterning using **laser ablation** through a metal **mask** was studied in detail to investigate the applicability of this method. Etch rates as a function of **laser** intensity were measured, and the process was followed in situ by online monitoring of the film resistivity.

ST **laser** patterning yttrium barium copper oxide; epitaxial film **laser ablation** prodn

IT Superconductors
(**laser ablation** patterning of epitaxial thin films of yttrium barium copper oxide on magnesium oxide single crystal in

relation to)
IT Epitaxy
Lithography
(**laser ablation** patterning of yttrium barium copper oxide thin films in relation to)
IT 109064-29-1P, Yttrium barium copper oxide (YBa2Cu3O7)
RL: PREP (Preparation)
(formation of high quality epitaxial thin film of, **laser ablation** patterning in)
IT 1309-48-4, Magnesium oxide, uses and miscellaneous
RL: USES (Uses)
(**laser ablation** pattern deposition of epitaxial thin films of yttrium barium copper oxide on single crystal of)

L8 ANSWER 187 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1990:621139 CAPLUS
DN 113:221139
TI Characterization methods for excimer exposure of deep-UV pellicles
AU Partlo, William N.; Oldham, William G.
CS Berkeley, Electron. Res. Lab., Univ. California, Berkeley, CA, 94720, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1990), 1264(Opt./Laser Microlithogr. 3), 564-575
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB A variety of instruments are used to monitor the aging of pellicles (membrane above lithog. **mask**) exposed to deep-UV radiation including densitometry, FTIR spectroscopy, UV spectroscopy, and ellipsometry. By far the most useful measurement is in situ transmission monitoring during exposure. A stable app. was constructed and good transmission vs. dose data obtained for a variety of pellicle materials. Using a light pipe uniformer fed by a KrF excimer **laser**, dose rates up to 0.4 W/cm2 can be obtained. Pellicle transmission changes due to optical thickness changes, **ablation** of antireflection-coatings, and increased bulk absorption were obsd. The pellicle's phys. thickness changes with exposure while it maintains an essentially const. refractive index. A method for measuring the pellicle's thickness during exposure was developed and showed that a dark reaction (continued thickness loss) occurs long after the deep-UV illumination is terminated.
ST lithog deep UV pellicle exposure aging
IT Membranes
(**photolithog**. deep-UV pellicles, exposure aging monitoring of)
IT Vinyl acetal polymers
RL: USES (Uses)
(butyrals, exposure aging monitoring of membranes of, in deep-UV **photolithog**.)
IT Lithography
(**photo**-, deep-UV, pellicle exposure aging monitoring in)

L8 ANSWER 188 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1989:223596 CAPLUS
DN 110:223596
TI Microlithography of high-temperature superconducting films: **laser ablation** vs. wet etching
AU Ballentine, P. H.; Kadin, A. M.; Fisher, M. A.; Mallory, D. S.; Donaldson, W. R.
CS Dep. Electr. Eng., Univ. Rochester, Rochester, NY, 14627, USA
SO IEEE Transactions on Magnetics (1989), 25(2), 950-3
CODEN: IEMGAQ; ISSN: 0018-9464
DT Journal
LA English
CC 76-4 (Electric Phenomena)

Section cross-reference(s): 74

AB Narrow lines and microbridge structures have been etched in sputtered superconducting films of Y Ba Cu oxide by variations of two methods. The first uses std. **photolithog**. followed by wet etching in weak acid. The second uses a **maskless** process involving a focused pulsed YAG **laser** together with a computer-controlled x-y stage to produce local **ablation** of the superconducting film. Issues relating to limits of resoln., annealing of films, and degrdn. of superconducting properties are critically discussed for the two approaches.

ST superconductor cuprate **laser ablation** wet etching; barium yttrium copper oxide microlithog

IT Superconductors
(barium copper yttrium oxide, microlithog. of films of, **laser ablation** vs. wet etching in)

IT **Laser** radiation, chemical and physical effects
(microlithog. of barium copper yttrium oxide films by)

IT Lithography
(of barium copper yttrium oxide films by **laser ablation**)

IT Etching
(of high-temp. superconducting films, **laser ablation** comparison with)

IT Lithography
(submicron, of barium copper yttrium oxide films by **laser ablation**)

IT 7647-01-0, Hydrochloric acid, uses and miscellaneous 7664-38-2, Phosphoric acid, uses and miscellaneous
RL: TEM (Technical or engineered material use); USES (Uses)
(in wet etching of superconducting films, comparison of **laser ablation** with)

IT 109064-29-1, Barium copper yttrium oxide ($Ba_2Cu_3YO_7$)
RL: PRP (Properties)
(superconducting film of, high-temp., microlithog. of, **laser ablation** vs. wet etching in)

L8 ANSWER 189 OF 200 CAPLUS
AN 1989:182981 CAPLUS
DN 110:182981
TI Excimer **laser** patterning of a novel resist
IN Wojnarowski, Robert J.; Eichelberger, Charles W.
PA General Electric Co., USA
SO U.S., 9 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM B44C001-22
ICS C23F001-02; B29C037-00; C03C015-00
NCL 156643000
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4780177	A	19881025	US 1988-152510	19880205
	US 4842677	A	19890627	US 1988-224416	19880726
	JP 02004264	A2	19900109	JP 1989-24074	19890203
PRAI	US 1988-152510		19880205		
	US 1988-224416		19880726		

AB A **photopatterning** method for providing a high-resoln. conductive pattern on a polymeric or ceramic substrate having great surface roughness and nonplanar design features, such as channels, bosses, and ridges, comprises the step of depositing a thin **ablatable photoabsorptive** polymer layer on a metal layer-coated substrate, depositing over the polymer layer a thicker layer of a substantially

transparent material selected from poly(Me methacrylate), poly(ethyl) methacrylate, and polycarbonates, directing an UV excimer **laser** beam through the upper layer to irradiate the lower layer which is **ablated** with simultaneous removal of the thick layer above it, resulting in the ability to etch high resoln. features on the substrate, particular a Cu-coated polyetherimide circuit board. The **photopatterning** method is applicable in fabricating VLSI wafers and various high-d. interconnected systems used in chip devices. A **mask** for **photopatterning** and a method for producing it are also seen to be desirable because of the high **laser** energy d. generally desired for thorough **ablation**.

ST **photopatterning** high resoln conductive pattern; **photoresist** dual conductive pattern substrate

IT Polycarbonates, uses and miscellaneous
RL: USES (Uses)
(dual-layer **photoresists** contg., patterning of, using excimer **laser** for prodn. of conductive patterns on polymeric and ceramic substrates)

IT Semiconductor devices
(patterning of **photoresists** using excimer lasers for prodn. of conductive patterns on polymeric and ceramic substrates in fabrication of)

IT Electric circuits
(integrated, patterning of **photoresists** using excimer lasers for prodn. of conductive patterns on polymeric and ceramic substrates in fabrication of)

IT Resists
(**photo**-, patterning of, using excimer lasers for prodn. of conductive patterns on polymeric and ceramic substrates)

IT 9003-42-3, Poly(ethyl methacrylate) 9011-14-7, Poly(methyl methacrylate)
RL: USES (Uses)
(dual-layer **photoresists** contg., patterning of, using excimer **laser** for prodn. of conductive patterns on polymeric and ceramic substrates)

IT 7429-90-5P, Aluminum, uses and miscellaneous 7440-32-6P, Titanium, uses and miscellaneous
RL: PREP (Preparation); USES (Uses)
(patterning of **photoresists** in prodn. of conductive patterns of, on polymeric and ceramic substrates in fabrication of semiconductor devices)

L8 ANSWER 190 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1989:86749 CAPLUS
DN 110:86749
TI Patterning of dispenser cathode surfaces to a controlled porosity
AU Garner, Charles E.; Deininger, William D.; Gibson, John; Thomas, Richard
CS Jet Propul. Lab., California Inst. Technol., Pasadena, CA, 91109, USA
SO IEEE Transactions on Electron Devices (1989), 36(1, Pt. 2), 158-68
CODEN: IETDAI; ISSN: 0018-9383
DT Journal
LA English
CC 76-12 (Electric Phenomena)

AB A process was developed to pattern slots .apprx.1.25 .mu.m in width into 25-.mu.m thick W films that have been deposited onto flat or concave surfaces. These techniques are summarized as follows: a 25-.mu.m-thick W film with a high degree of (100) orientation is chem. vapor deposited (CVD) onto a flat or concave Mo mandrel. Next, a 5-.mu.m-thick Al film is deposited onto the CVD W, followed by 2 .mu.m of AZ 1350 **photoresist**. On concave cathodes, Xe dichloride **laser ablation** or x-ray lithog. is used to pattern the **photoresist**, whereas on flat cathodes deep UV lithog. can be employed. The patterned **photoresist** serves as the **mask** in a Cl ion beam assisted etching (IBAE) process to pattern the Al. An alternative process is to deposit Al oxide films onto the W and pattern the Al oxide using **laser ablation**. The W film is then

patterned to 3-6-.mu.m slot widths using IBAE + ClF3 with the patterned Al or oxide as the **mask**. Finally, a sputter-deposition step is required to close up to 3-6-.mu.m-wide slots to .apprx.1 .mu.m. The process described is capable of patterning concave dispenser cathodes to a controlled and precision porosity.

ST dispenser cathode surface patterning; tungsten patterning dispenser cathode

IT Resists
(AZ 1350, in dispenser-cathode processing)

IT **Laser** radiation, chemical and physical effects
(**ablation** by, in dispenser-cathode processing)

IT Porosity
(patterning of disperser cathode surfaces to controlled)

IT Cathodes
(dispenser, patterning of surfaces of, to controlled porosity)

IT Sputtering
(etching, ion-beam, in dispenser-cathode processing)

IT Lithography
(**photo**-, UV, in dispenser-cathode processing)

IT Etching
(sputter, ion-beam, in dispenser-cathode processing)

IT Lithography
(x-ray, in dispenser-cathode processing)

IT 7782-50-5, Chlorine, reactions 7790-91-2, Chlorine fluoride (ClF3)
RL: RCT (Reactant); RACT (Reactant or reagent)
(ion-beam-assisted etching with, in dispenser-cathode processing)

IT 7440-33-7, Tungsten, uses and miscellaneous
RL: USES (Uses)
(patterning from slots into films of, in dispenser-cathode processing)

IT 54183-79-8, AZ 1350
RL: USES (Uses)
(resist, in dispenser-cathode processing)

L8 ANSWER 191 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1988:560400 CAPLUS
DN 109:160400
TI Chromium **mask** damage in excimer **laser** projection processing
AU Yeh, J. T. C.
CS Thomas J. Watson Res. Cent., IBM Res. Div., Yorktown Heights, NY, 10598, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1988), 922(Opt./Laser Microlithogr.), 461-3
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Cr **masks** used for conventional optical lithog. were evaluated for their damage under excimer **laser** irradn. at 248 and 308 nm. The damage of Cr films on quartz ranged from erosion of pattern edges to total **ablation** depending on the fluence. At low fluences, cumulative stressing of the Cr films by the **laser** pulses leads to development of fine cracks. Difference in damage threshold at 248 nm and 308 nm was obsd.

ST chromium **mask** damage excimer **laser**; submicron lithog chromium **mask** damage

IT **Photomasks**
(chromium, damage in excimer **laser** projection processing)

IT Lithography
(sub-.mu., chromium **mask** damage in excimer **laser** projection processing in)

IT 7440-47-3, Chromium, uses and miscellaneous
RL: USES (Uses)
(**mask**, damage of, in excimer **laser** projection

processing)

L8 ANSWER 192 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1988:539185 CAPLUS
DN 109:139185
TI **Photomasks** for high-energy **laser** projection etching and manufacture thereof
IN Kirch, Steven James; Lankard, John Robert; Ritsko, John Hames; Smith, Kurt Alan; Speidell, James Louis; Yeh, James Tien Cheng
PA International Business Machines Corp., USA
SO Eur. Pat. Appl., 6 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM G03F001-00
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 265658	A2	19880504	EP 1987-113673	19870918
	EP 265658	A3	19890315		
	EP 265658	B1	19930407		
	R: DE, FR, GB, IT				
	JP 01118134	A2	19890510	JP 1987-117265	19870515
	JP 07097216	B4	19951018		
	US 4923772	A	19900508	US 1989-341273	19890417
PRAI	US 1986-924480		19861029		

AB The following **photomask** withstands a high energy **laser** beam of .gtoreq. several hundred mJ/cm2 such as a 248 nm wavelength **laser** for a projection etching. It has a UV grade synthetic fused silica substrate and an opaque pattern comprising .gtoreq. 2 dielec. layers having alternating high and low indexes of refraction such as an Al2O3 layer and a SiO2 layer. The **photomask** is manufd.. by depositing an alternating sequence of layers of dielec. materials. During deposition the thickness of each higher index dielec. layer is adjusted to a quarter of the wavelength of the **laser** beam.
ST **laser** projection etching UV **photomask**
IT Etching
(projection, **laser ablative**, **masks** for, manuf. of)
IT 1344-28-1, Aluminum oxide, properties 7631-86-9, Silicon dioxide, properties 7783-40-6, Magnesium fluoride 7783-57-5, Thallium fluoride 12060-08-1, Scandium oxide 13775-53-6 37230-85-6, Hafnium oxide
RL: PRP (Properties)
(high energy **laser** projection etching **photomasks** with opaque layer from)

L8 ANSWER 193 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1988:195769 CAPLUS
DN 108:195769
TI Edge profile control in **laser ablation** of polymers: proximity etching
AU Yeh, J. T. C.; Donelon, J. J.
CS IBM Res. Div., T. J. Watson Res. Cent., Yorktown Heights, NY, 10598, USA
SO Proceedings - Electrochemical Society (1988), 88-10(Proc. Symp. Laser Processes Microelectron. Appl., 1987), 95-103
CODEN: PESODO; ISSN: 0161-6374
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Excimer **laser** direct **ablation** of polymers which may be used in electronic applications offers many advantages in process simplicity. It is often desirable to control the edge profile of the

etched pattern for various applications. By adjusting the **mask** -to-substrate distance, the edge profile can be varied from nearly vertical to very much tapered. The results agree with the simple near-field Fresnel diffraction model coupled with material etch depth dependence on **laser** fluence. Other factors that affects the edge profile include the polymer material thickness and the amt. of over-etching employed to generate the etched pattern.

ST **laser** proximity etching polymer **photoresist**; polyimide **laser** proximity etching

IT Polyimides, reactions
RL: PRP (Properties)
(edge profile control in **laser ablation**-proximity etching of, in pattern information)

IT Polymers, reactions
RL: PRP (Properties)
(**laser ablation**-proximity etching of, edge profile control in)

IT Etching
(dry, **laser**-induced, of polymers in edge profile control)

IT Resists
(**photo**-, polymeric, edge profile control in **laser ablation**-proximity of)

L8 ANSWER 194 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1988:140587 CAPLUS
DN 108:140587
TI Pattern definition and formation on curved surfaces
AU Deininger, William D.; Garner, Charles E.
CS Jet Propuls. Lab., California Inst. Technol., Pasadena, CA, 91109, USA
SO Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (1988), 6(1), 337-40
CODEN: JVTBD9; ISSN: 0734-211X
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Techniques are discussed which are used to delineate and form patterns on curved surfaces. Patterns were generated in AZ1350 **photoresist** using electron-beam writing and xenon-chloride excimer **laser** writing and **ablation**. Expts. were conducted on spherically concave surfaces which had a radius of curvature of 0.879 cm. Surface patterns 10 .mu.m in width and varying in length from 40 .mu.m to 0.6 cm were written. These beam-writing techniques show clear superiority over conventional UV **photolithog**. techniques for patterning nonflat surfaces. The resulting patterned **photoresist** can then be used as a **mask** for use with wet or dry etching techniques to form the desired surface features.
ST **photoresist** electron pattern curved surface
IT Resists
(**photo**-, electron beam writing on, for pattern formation on curved surfaces)
IT 54183-79-8, AZ1350
RL: USES (Uses)
(pattern formation on curved surfaces using electron beam writing on layer of)

L8 ANSWER 195 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1987:599756 CAPLUS
DN 107:199756
TI Generation of undercut profiles in **ablative photodecomposition** of polymers
AU Anon.
CS USA
SO Research Disclosure (1987), 273, 30
CODEN: RSDSBB; ISSN: 0374-4353

DT Journal
LA English
CC 38-3 (Plastics Fabrication and Uses)
AB Polymer surfaces having an undercut cross-sectional profile with an angle of 5-15.degree. could be obtained by placing the work (polymer and **mask**) at the required angle to a **laser** beam. Circular symmetry in the etched pattern was obtained by rotating the work around its own axis by an elec. motor. The angle of the undercut was dependent on the angle at which the sample rotated.
ST undercut profile polymer **ablative photodecompn**; **laser** etching polymer undercut profile
IT Polymers, uses and miscellaneous
RL: RCT (Reactant); RACT (Reactant or reagent)
(etching of, **laser** generation of undercut profiles in)
IT **Laser** radiation, chemical and physical effects
(in generation of undercut profiles of polymers)
IT Etching
(of polymers, generation of undercut profiles in, by lasers)
IT Polymer degradation
(**ablative**, **photochem**., of polymers, generation of undercut profiles by)

L8 ANSWER 196 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1987:147125 CAPLUS
DN 106:147125
TI Apparatus for **photomask** repair
IN Young, Peter; Oprysko, Modest M.; Beranek, Mark W.
PA Gould, Inc., USA
SO Eur. Pat. Appl., 16 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM G03F001-00
ICS G03B041-00
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 193673	A2	19860910	EP 1985-306643	19850918
	EP 193673	A3	19881228		
	R: AT, BE, DE, FR, GB, NL, SE				
	CA 1244521	A1	19881108	CA 1985-492237	19851004
	JP 61201252	A2	19860905	JP 1985-274839	19851206
PRAI	US 1985-707437		19850301		

AB An app. for repairing both clear and opaque defects in a **photomask** having a metal film pattern on a glass plate uses a visible **laser** light source pulsed at selected frequencies to direct an optically focused **laser** beam into a gas sealed cell contg. a **mask**. At 1 frequency, the **laser** pulses **ablate** opaque **mask** defects. At another frequency and with the cell filled with a metal-bearing gas, the **laser** beam causes thermal decompn. of the gas and deposition of metal to cure clear defects.
ST defect repair pattern **photomask**; **laser** defect repair pattern **photomask**
IT **Photomasks**
(defect repair in, with metal film pattern, **laser**-based app. for)
IT **Laser** radiation, chemical and physical effects
(in repair of defects in metal film patterns on **photomasks**)

L8 ANSWER 197 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1986:434064 CAPLUS
DN 105:34064
TI Precision marking of layers

IN   Caplan, Sandor
PA   Chronar Corp., USA
SO   U.S., 5 pp.
      CODEN: USXXAM
DT   Patent
LA   English
IC   ICM C23F001-02
      ICS B44C001-22; C03C015-00; C03C025-06
NCL   156643000
CC   76-5 (Electric Phenomena)
      Section cross-reference(s): 52
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4568409	A	19860204	US 1983-552737	19831117
PRAI	US 1983-552737		19831117		

AB   A method of precision sepn. of metallic layers on semiconductor layers (e.g., for **photovoltaic** devices, esp. solar cells) comprises: (1) coating the layer(s) to be sepd. with a material (e.g., a polymer contg. a dye) which absorbs a selected spectral frequency and which is resistant to the etchant for the layer(s); (2) evapg. (e.g., using a **laser**) the coating material selectively to form a **mask**; and (3) etching the underlying layer(s) where the coating has been removed. Thus, 3 successive Si layers (p-i-n structure) made from silanes on transparent Sn oxide were parted with a Nd YAG **laser** to produce gaps of .apprx.0.1 mm. The structure was then coated with Al 0.2 .mu. thick and a 2-3 .mu. thick polymer (Dykem Staining DL) layer contg. nigrosine dye 1.1 wt.%. The polymer layers were parted by using the same **laser** at a rate of .apprx.13 cm/s, and the Al layer was parted by etching to produce sepns. of .apprx.0.1 mm. The technique avoids undesired alloying which results from conventional **laser** scribing techniques used to sep. adjoining cells in **photovoltaic** device manuf.
ST   etching **mask** formation **laser ablation**; solar cell layer **laser** marking; **photovoltaic** device layer **laser** marking
IT   **Laser** radiation, chemical and physical effects
         (**ablation** by, of dye-sensitized coatings, for etching **mask** formation in **photovoltaic** device fabrication)
IT   **Photoelectric** devices, solar
         (etching **mask** formation for metal overlayer sepn. in fabrication of)
IT   Etching
         (**masks**, **laser ablation** of dye-sensitized coatings for formation of, in **photovoltaic** device fabrication)
IT   7429-90-5, reactions
      RL: RCT (Reactant); RACT (Reactant or reagent)
         (etching of, **laser ablation** of dye-sensitized coatings for formation of **mask** for, in **photovoltaic** device fabrication)
IT   103171-05-7
      RL: USES (Uses)
         (**laser ablation** of dye-sensitized layers of, for etching **mask** formation in **photovoltaic** device fabrication)
IT   7440-02-0D, complexes with bis(4-dimethylaminodinitrobenzil)   8005-03-6
      103175-07-1D, nickel complexes
      RL: USES (Uses)
         (**laser ablation** of polymer films sensitized by, for etching **mask** formation in **photovoltaic** device fabrication)
IT   7440-21-3, uses and miscellaneous
      RL: DEV (Device component use); USES (Uses)
         (**photovoltaic** devices, **laser ablation** of

dye-sensitized coatings for **mask** formation for metal overlayer etching in fabrication of)

L8 ANSWER 198 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1986:428195 CAPLUS
DN 105:28195
TI Xenon monochloride **laser** controlled chemical etching of aluminum in chlorine gas
AU Koren, G.; Ho, F.; Ritsko, J. J.
CS Phys. Dep., Technion, Haifa, 32000, Israel
SO Applied Physics A: Solids and Surfaces (1986), A40(1), 13-23
CODEN: APSFDB; ISSN: 0721-7250
DT Journal
LA English
CC 56-6 (Nonferrous Metals and Alloys)
Section cross-reference(s): 66, 73, 76
AB The 308 nm XeCl **laser** assisted etching of thin Al films on Si substrates in Cl was investigated. Etch rates were measured vs. the **laser** fluence on the sample, the **laser** repetition rate, the Cl pressure and the sample temp. Irradn. expts. under vacuum of films which were previously exposed to Cl and **laser** assisted etching in rare gases, N, and air mixts. with Cl were performed to elucidate the mechanism of the etching. The surface morphol. was investigated by SEM. Etch rates of .ltorsim.1.5 .mu. per pulse are obtained which are strongly dependent on the Cl pressure and sample temp. The etching mechanism is essentially a chem. chlorination of the Al in between the **laser** pulses which is followed by **photo-ablation** of the reaction products. AlCl3 evapn. and redeposition explain the obsd. results. The Al films are etched fully and cleanly without damage to the smooth Si substrate. Etching through adjacent or imaged **mask** on the Al film yields relatively smooth and well defined Al walls with structures of the order of 1 .mu..
ST aluminum film **laser** etching chlorine
IT **Laser** radiation, chemical and physical effects
(in etching, of aluminum thin films, by chlorine)
IT Etching
(of aluminum thin films, in chlorine, **laser**-assisted)
IT 7782-50-5, reactions
RL: PRP (Properties)
(etching in, of aluminum thin films, **laser**-assisted)
IT 7429-90-5, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(etching of thin films of, in chlorine, **laser**-assisted)

L8 ANSWER 199 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1985:479343 CAPLUS
DN 103:79343
TI Self-developing **photoresist** using a vacuum ultraviolet molecular fluorine excimer **laser** exposure
AU Henderson, D.; White, J. C.; Craighead, H. G.; Adesida, I.
CS AT and T Bell Lab., Holmdel, NJ, 07733, USA
SO Applied Physics Letters (1985), 46(9), 900-2
CODEN: APPLAB; ISSN: 0003-6951
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB An F2 excimer **laser** at 157 nm was used for the 1st time as an exposure source for high resoln. **photolithog.** with a self-developing nitrocellulose **photoresist**. **Ablative** development of the nitrocellulose **photoresist** was obsd. for 157-nm energy d. >0.025 J/cm2. Stencil **masks** fabricated using electron beam lithog. were used for contact **photolithog.**, and **mask** features to 200 nm were reproduced. These are the smallest features yet reproduced from a **mask** with an optical,

self-developing **photoresist** technol.
ST UV fluorine **laser photoresist** exposure; developing
self **photoresist** fluorine **laser**
IT Lithography
(**photo**-, self-developing nitrocellulose layer for, mol.
fluorine excimer vacuum UV **laser** for exposure of)
IT Resists
(**photo**-, self-developing, nitrocellulose, mol. fluorine
excimer vacuum UV **laser** for exposure of)
IT **Laser** radiation, chemical and physical effects
(vacuum-UV, for exposure of self-developing nitrocellulose
photoresist)
IT 7782-41-4, uses and miscellaneous
RL: USES (Uses)
(vacuum UV excimer **laser**, for exposure of self-developing
nitrocellulose **photoresist**)
IT 9004-70-0
RL: USES (Uses)
(vacuum UV **photoresist**, mol. fluorine excimer **laser**
for exposure of)

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(FILE 'HOME' ENTERED AT 14:51:45 ON 23 OCT 2003)

FILE 'CAPLUS' ENTERED AT 14:51:58 ON 23 OCT 2003

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L1          0 S SCOTT AND LASER AND MASK
L2        314 S ABLAT? AND LASER AND MASK
L3        145 S L2 AND PHOTO?
L4          0 S L3 AND (INFRARED OR INFRA RED )
L5          7 S L3 AND (INFRARED OR INFRA RED  OR IR)
L6          0 S ABLAT? AND LASER AND MASKE
L7        441 S ABLAT? AND LASER AND MASK?
L8        200 S L7 AND PHOTO?
```

=> d all 100

L8 ANSWER 100 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:775864 CAPLUS
DN 130:145408
TI Next-generation polymeric **photonic** devices
AU Eldada, Louay; Shacklette, Lawrence W.; Norwood, Robert A.; Yardley, James T.
CS Engineered Materials Sector, Electronic & Optical Materials Division, AlliedSignal Inc., Morristown, NJ, 07962, USA
SO Critical Reviews of Optical Science and Technology (1997), CR68(Sol-Gel and Polymer Photonic Devices), 207-227
CODEN: CROTE2; ISSN: 1018-1997
PB SPIE-The International Society for Optical Engineering
DT Journal; General Review
LA English
CC 73-0 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 38, 74
AB A review, with 17 refs. A versatile polymeric waveguide technol. is proposed for low-cost high-performance **photonic** devices that address the needs of both the telecom and the datacom industries. The authors have developed advanced org. polymeric materials that can be readily made into both multimode and single-mode optical waveguide structures of controlled numerical aperture (NA) and geometry. These materials are formed from highly-crosslinked acrylate monomers with specific linkages that det. properties such as flexibility, toughness, loss, and stability with temp. and humidity. These monomers are intermiscible, providing for precise adjustment of the refractive index

from 1.3 to 1.6. Waveguides are formed **photolithog.**, with the
liq. monomer mixt. polymg. upon illumination in the UV via either
mask exposure or **laser** direct-writing. A wide range of
rigid and flexible substrates can be used, including glass, quartz,
oxidized Si, glass-filled epoxy printed circuit board substrate, and
flexible polyimide film. The authors discuss the use of these materials
on chips, on multi-chip modules (MCM's), on boards, and on backplanes.
Light coupling from and to chips is achieved by cutting 45.degree. mirrors
using Excimer **laser ablation**. Fabrication of the
planar polymeric structures directly on the modules provides for
stability, ruggedness, and hermeticity in packaging.

ST review polymer **photonic** device **photolithog** acrylate;
mirror **photonic** device polymer **laser** machining review;
glass substrate **photonic** device polymer review; silica substrate
photonic device polymer review

IT Mirrors
(integrated optics; next-generation polymeric **photonic**
devices)

IT Machining
(**laser**; next-generation polymeric **photonic** devices)

IT Optical integrated circuits
Optical waveguides
Photolithography
(next-generation polymeric **photonic** devices)

IT Acrylic polymers, uses
Glass, uses
Polymers, uses
RL: DEV (Device component use); USES (Uses)
(next-generation polymeric **photonic** devices)

IT Optical instruments
(**photonic**; next-generation polymeric **photonic**
devices)

IT 7631-86-9, Silicon dioxide, uses
RL: DEV (Device component use); USES (Uses)
(next-generation polymeric **photonic** devices)

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Anon; Polymer Hadbook 2nd edition 1975, PIII
(2) Beeson, K; Nonlin Opt 1992, V3, P205 CAPLUS
(3) Eladada, L; J Lightwave Technol 1992, V10, P1610
(4) Eldada, L; J Lightwave Technol 1994, V12, P1588 CAPLUS
(5) Eldada, L; J Lightwave Technol 1995, V13, P2034 CAPLUS
(6) Eldada, L; J Lightwave Technol 1996, V14, P1704 CAPLUS
(7) Eldada, L; Proc LEOS Summer Topical Meeting of WDM Components Technology 1997
(8) Eldada, L; Proc MPPOI '96 1996, V192
(9) Eldada, L; Proc Organic Thin Films for Photonics Applications Topical Meeting Tech Dig 1997
(10) Eldada, L; Proc SPIE 1997, V3006, P344 CAPLUS
(11) Norwood, R; Proc SPIE 1996, V2690, P151 CAPLUS
(12) Tsao, J; Appl Phys Lett 1983, V42, P559 CAPLUS
(13) Yardley, J; Proc SPIE 1997, V3005, P155 CAPLUS

=> d all 101-149

L8 ANSWER 101 OF 200 CAPLUS

AN 1998:754211 CAPLUS

DN 130:117004

TI **Photosensitivity** of lead germanate glass waveguides grown by
pulsed **laser** deposition

AU Mailis, Sakellaris; Anderson, Andrew A.; Barrington, Stephen J.;
Brocklesby, William S.; Greef, Robert; Rutt, Harvey N.; Eason, Robert W.;
Vainos, Nikolaos A.; Grivas, Christos

CS Optoelectronics Research Centre, Department of Physics and Astronomy and

Department of Chemistry, Southampton University, Southampton, SO17 1BJ, UK
SO Optics Letters (1998), 23(22), 1751-1753
CODEN: OPLEDP; ISSN: 0146-9592
PB Optical Society of America
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 57
AB The authors report very large **photoinduced** refractive-index changes .DELTA.n, of the order of .apprx.102, in lead germanate glass waveguides grown by pulsed-**laser** deposition. The magnitude of .DELTA.n was derived from measurements of diffraction efficiency for gratings written by exposure to 244-nm light through a phase **mask** , whereas the sign of .DELTA.n was detd. from ellipsometric data. Results are shown for films grown under O pressures ranging from 1 .times. 10-2 to 6 .times. 10-2 mbars (1.33 mbars = 1 torr).

ST lead germanate glass optical waveguide **photorefractive** effect; ellipsometry lead germanate glass optical waveguide **photorefractive** effect; film lead germanate glass optical waveguide **photorefractive** effect; oxygen **laser** deposition lead germanate glass optical waveguide **photorefraction** ; refractive index lead germanate glass optical waveguide **photorefractive** effect; barium monoxide lead germanate glass optical waveguide **photorefractive** effect; zinc monoxide lead germanate glass optical waveguide **photorefractive** effect; UV lead germanate glass optical waveguide **photorefractive** effect; **laser** deposition lead germanate glass optical waveguide **photorefractive** effect; grating diffraction lead germanate glass optical waveguide

IT Glass, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(germanate, barium lead potassium zinc germanate; **photosensitivity** of lead germanate glass optical waveguides grown by pulsed **laser** deposition)

IT Vapor deposition process
(**laser ablation**; **photosensitivity** of lead germanate glass optical waveguides grown by pulsed **laser** deposition)

IT Ellipsometry
Films
Laser induced grating
Optical diffraction
Optical waveguides
Photorefractive effect
Refractive index
UV and visible spectra
(**photosensitivity** of lead germanate glass optical waveguides grown by pulsed **laser** deposition)

IT 7782-44-7, Oxygen, uses
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**photosensitivity** of lead germanate glass optical waveguides grown by pulsed **laser** deposition)

IT 1304-28-5, Barium monoxide, properties 1310-53-8, Germania, properties 1314-13-2, Zinc monoxide, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**photosensitivity** of lead germanate glass optical waveguides grown by pulsed **laser** deposition)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Amossov, A; J Non-Cryst Solids 1994, V179, P75 CAPLUS
(2) Bazylenko, M; Opt Lett 1988, V23, P697

(3) Campbell, R; Int J Optoelectron 1994, V9, P33
(4) Dumbaugh, W; Proc SPIE 1981, V297, P80 CAPLUS
(5) Lincoln, J; Electron Lett 1992, V28, P1021 CAPLUS
(6) Mailis, S; Opt Mater (to be published)
(7) Nishii, J; Opt Lett 1996, V21, P1360 CAPLUS

L8 ANSWER 102 OF 200 CAPLUS
AN 1998:545681 CAPLUS
DN 129:182100
TI Manufacture of aluminum **ablation mask** with high resolving power for **photolithography**
IN Cordes, Steven A.; Speidell, James L.; Patel, Rajeshs S.
PA International Business Machines Corp., USA
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM G03F001-08
ICS B23K026-06; C23F004-00
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 56, 73
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10221838	A2	19980821	JP 1998-12876	19980126
	JP 2953614	B2	19990927		
PRAI	US 1997-789905		19970129		

AB The manufg. method of an Al **mask** for **laser ablation** with fluence about 200-500 mJ/cm2 involves the following steps: (1) forming a **mask** precursor comprising a transparent substrate having thereon (A) a layer having high UV refractive index, i.e., Al, and (B) a **photoresist** layer; (2) dry-etching of the precursor under the condition wherein a part of the exposed portion of the layer having high UV refractive index is etched and the rest of the exposed portion is not etched; and (3) chem. etching of the rest of the exposed portion remained to be unetched in the the step 2. The **mask** shows improved dimensional accuracy.

ST aluminum **mask laser ablation photolithog** manuf; **photoresist** aluminum **laser ablation mask**; dry etching aluminum patterned **mask** manuf; chem etching aluminum patterned **mask** manuf

IT Sputtering
(etching, ion-beam; manuf. of aluminum **mask** for **photolithog. laser ablation** by dry etching and chem. etching)

IT Sputtering
(etching, reactive; in manuf. of aluminum **mask** for **photolithog. laser ablation** by dry etching and chem. etching)

IT **Photoresists**
(in manuf. of aluminum **mask** for **photolithog. laser ablation** by dry etching and chem. etching)

IT Etching
Laser ablation
Photolithography
(manuf. of aluminum **mask** for **photolithog. laser ablation** by dry etching and chem. etching)

IT Etching
(sputter, ion-beam; manuf. of aluminum **mask** for **photolithog. laser ablation** by dry etching and chem. etching)

IT Etching
(sputter, reactive; in manuf. of aluminum **mask** for **photolithog. laser ablation** by dry etching

and chem. etching)
IT Transparent materials
(substrate; manuf. of aluminum **mask** for **photolithog**
. **laser ablation** by dry etching and chem. etching)
IT 7782-50-5, Chlorine, processes 10294-34-5, Boron trichloride
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in manuf. of aluminum **mask** for **photolithog**.
laser ablation by chem. etching and reactive ion
etching using)
IT 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1, Argon, uses
7440-59-7, Helium, uses 7440-63-3, Xenon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(manuf. of aluminum **mask** for **photolithog**.
laser ablation by chem. etching and dry etching in)
IT 7429-90-5, Aluminum, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or
engineered material use); PROC (Process); USES (Uses)
(manuf. of aluminum **mask** for **photolithog**.
laser ablation by dry etching and chem. etching)
IT 7782-40-3, Diamond, uses 14808-60-7, Quartz, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(transparent substrate; manuf. of aluminum **mask** for
photolithog. **laser ablation** by dry etching
and chem. etching)

L8 ANSWER 103 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:452326 CAPLUS
DN 129:195701
TI Pattern precision of excimer **ablation** lithography (EAL)
AU Suzuki, Kenkichi; Ogino, Toshio; Terabayashi, Takao; Kawamoto, Kazutami;
Hirayama, Hiroyuki
CS Electron Tube and Devices Div., Hitachi, Ltd., Chiba, 297, Japan
SO Proceedings of SPIE-The International Society for Optical Engineering
(1998), 3274(Laser Applications in Microelectronic and Optoelectronic
Manufacturing III), 236-243
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other
Reprographic Processes)
AB Differences between EAL and the conventional **photolithog**. are
mainly with respect to the resist materials and the **mask**. The
mask consists of dielec. multilayer reflector, and the thickness
and the structure are completely different from Cr **masks**. This
paper is aimed to clarify the influences of dielec. **mask** to the
image qualities, and presents a rigorous simulation of the diffraction by
the dielec. **mask** and preliminary exptl. results. These results
show that for low N.A. imaging system, there are no substantial
differences between the dielec. **mask** and the metal **mask**
concerning the resoln. power, however further investigations are required
for the interpretation of rather wide resist edge corresponding to a
straight edge of the large opening **mask**.
ST excimer **ablation** lithog dielec multilayer **mask**
IT **Photomasks** (lithographic **masks**)
(dielec.; dielec. multilayer **mask** for excimer **laser**
ablation lithog.)
IT **Photoresists**
(**laser ablation**; effect of multilayer dielec.
mask on image precision in excimer **laser**
ablation lithog.)
IT Lithography
(**laser ablation**; pattern precision of excimer
laser ablation lithog.)
IT **Photolithography**

(pattern precision of excimer **laser ablation**
lithog.)
IT **Laser ablation**
(pattern precision of excimer **laser ablation**
lithog. in relation to)
IT Polyurethanes, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(resist; pattern precision of excimer **laser ablation**
lithog.)
IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 12055-23-1, Hafnium dioxide
RL: DEV (Device component use); USES (Uses)
(dielec. multilayer **mask** for excimer **laser**
ablation lithog.)
RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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L8 ANSWER 104 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:388682 CAPLUS
DN 129:38372
TI Surface patterning of affinity reagents using **photoablation**
IN Roberts, Matthew A.; Laederach, Alain; Bercier, Paul; Girault, Hubert Hugues; Seddon, Brian
PA Ecole Polytechnique Federale De Lausanne (Laboratoire D'Electrochimie), Switz.; Roberts, Matthew A.; Laederach, Alain; Bercier, Paul; Girault, Hubert Hugues; Seddon, Brian
SO PCT Int. Appl., 40 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM G01N033-543
ICS G01N033-53
CC 9-2 (Biochemical Methods)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9823957	A1	19980604	WO 1997-GB3246	19971127
	W: JP, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 944834	A1	19990929	EP 1997-945953	19971127
	EP 944834	B1	20021023		
	R: CH, DE, ES, FR, GB, IT, LI				
PRAI	GB 1996-24686	A	19961127		
	WO 1997-GB3246	W	19971127		

AB UV-**laser photoablation** is used for the 3-dimensional patterning of biol. and chem. substances onto polymer and other UV-absorbing substrates to form biosensors for various anal. tasks. This method creates **ablated** lines, holes, or entire networks of structures which may selectively contain a chem. substance of interest and have crit. dimensions in the range of 1-1000 .mu.m. High-energy pulses are fired at a protected polymer substrate, such as cellulose acetate, polystyrene, polycarbonate, polyethylene terephthalate, or polyimide, from an UV excimer **laser**, thereby creating an **ablated** cavity which passes through the protective layer and into the underlying substrate. Complex geometrical structures may be fabricated by repetitive firing of the **laser** through a series of **masks** onto stationary substrates. The resulting **ablated**-polymer structures show increased rugosity which enhances the surface area for binding chem. or biol. receptors, including enzymes, antibodies, nucleic acids, other

polymers, gels, membranes, etc. Binding may then be accomplished via simple adsorption or through covalent and/or noncovalent conjugation to the entire surface, both **ablated** and non-**ablated**.
After the binding step, the protective layer can simply be peeled off, thereby removing the binding material from all surfaces, except that which is defined by UV-**laser photoablation**. The resulting
surface is then left in a state which is chem. and geometrically defined by the initial UV-**laser** exposure.

ST **photoablation** polymer surface biosensor prepn; affinity reagent prepn **photoablation** polymer surface

IT **Ablation**
(light-induced; prepn. of affinity reagents and other biosensors using **photoablation** of polymer surfaces)

IT Biosensors
Photoaffinity
(prepn. of affinity reagents and other biosensors using **photoablation** of polymer surfaces)

IT Polycarbonates, analysis
Polyesters, analysis
Polyimides, analysis
RL: ARU (Analytical role, unclassified); BUU (Biological use, unclassified); DEV (Device component use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(prepn. of affinity reagents and other biosensors using **photoablation** of polymer surfaces)

IT 9003-53-6, Polystyrene 9004-35-7, Cellulose acetate 25038-59-9, Polyethylene terephthalate, analysis
RL: ARU (Analytical role, unclassified); BUU (Biological use, unclassified); DEV (Device component use); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(prepn. of affinity reagents and other biosensors using **photoablation** of polymer surfaces)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
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(2) Ecossensors Ltd; WO 9108474 A 1991 CAPLUS
(3) Jeffrey, S; WO 9408236 A 1994 CAPLUS
(4) Rober, A; WO 9423295 A 1994
(5) Univ California; WO 9639937 A 1996

L8 ANSWER 105 OF 200 CAPLUS
AN 1998:348502 CAPLUS
DN 129:47282
TI Direct writing of continuous-relief microoptics
AU Gale, M. T.
CS Paul Scherrer Institute, Zurich, CH-8048, Switz.
SO Micro-optics (1997), 87-126. Editor(s): Herzig, Hans Peter. Publisher: Taylor & Francis, London, UK.
CODEN: 66DNA2
DT Conference; General Review
LA English
CC 74-0 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB A review with many refs. in which fabrication of continuous-relief microoptical structures by direct writing is described. Two major direct writing technologies: **laser** beam writing and electron-beam writing are decribed.

ST review microoptics direct write relief; **laser** beam direct write microoptics review; electron beam direct write microoptics review; lithog direct write microoptics element review; **photolithog** direct write microoptics element review

IT Electron beam lithography
Electron beam resists
Electron beams
Fresnel lenses

Laser ablation
Laser radiation
Microlenses
Photolithography
Photoresists
(direct writing of continuous-relief microoptics)
IT Etching
(dry, **laser**-induced; direct writing of continuous-relief microoptics)
IT **Photomasks** (lithographic **masks**)
(half-tone; direct writing of continuous-relief microoptics)
IT Optical equipment
(micro-; direct writing of continuous-relief microoptics)
RE.CNT 61 THERE ARE 61 CITED REFERENCES AVAILABLE FOR THIS RECORD
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AN 1998:301212 CAPLUS
DN 129:38323
TI Computer-Controlled **Laser Ablation**: A Convenient and Versatile Tool for Micropatterning Biofunctional Synthetic Surfaces for Applications in Biosensing and Tissue Engineering
AU Vaidya, Rajesh; Tender, Leonard M.; Bradley, Gail; O'Brien, Michael J., II; Cone, Matthew; Lopez, Gabriel P.
CS Department of Chemical and Nuclear Engineering, University of New Mexico, Albuquerque, NM, 87131, USA
SO Biotechnology Progress (1998), 14(3), 371-377
CODEN: BIPRET; ISSN: 8756-7938
PB American Chemical Society
DT Journal
LA English
CC 9-16 (Biochemical Methods)
AB This paper describes **laser**-based methods for prepg. micropatterns of bioactive mol. species in self-assembled monolayers (SAMs) and micropatterns of proteins and other biol. mols. immobilized on solid substrates. Applications of these micropatterned surfaces in multianalyte biosensing and tissue engineering are emphasized. The focus of the paper is on the use of a computer-controlled **laser ablation** system comprising a research-grade inverted optical microscope, a pulsed nitrogen-pumped dye **laser** emitting at 390 nm, a programmable sample stage, and the computerized control system. The **laser** system can be implemented in a typical biosensor or tissue culture lab. to enable the facile and reproducible fabrication of micropatterned surfaces by several methods. Various methods for patterning are discussed with examples given and emphasis placed on (1) **laser ablation** in the fabrication of **photolithog . masks**, (2) electrochem. patterning of SAMs, and (3) **laser** desorption of SAMs. The relative merits of each technique are discussed with respect to application in fabrication of active surfaces for biosensing and tissue culture applications.
ST **laser ablation** micropatterning biofunctional surface biosensor; computer control **laser ablation** tissue engineering
IT Adsorbed monolayers
Biochemical molecules
Control apparatus
Imaging
Immobilization, biochemical
Laser ablation
Photolithography
Photomasks (lithographic **masks**)
Self-association
(computer-controlled **laser ablation** as a convenient

and versatile tool for micropatterning biofunctional synthetic surfaces
for applications in biosensing and tissue engineering)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(computer-controlled **laser ablation** as a convenient
and versatile tool for micropatterning biofunctional synthetic surfaces
for applications in biosensing and tissue engineering)

IT Surface plasmon
(resonance spectroscopy; computer-controlled **laser
ablation** as a convenient and versatile tool for micropatterning
biofunctional synthetic surfaces for applications in biosensing and
tissue engineering)

IT 2917-26-2, 1-Hexadecanethiol 130727-41-2
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(computer-controlled **laser ablation** as a convenient
and versatile tool for micropatterning biofunctional synthetic surfaces
for applications in biosensing and tissue engineering)

IT 7440-47-3, Chromium, uses 7440-57-5, Gold, uses 31900-57-9,
Silanediol, dimethyl-, homopolymer
RL: DEV (Device component use); USES (Uses)
(computer-controlled **laser ablation** as a convenient
and versatile tool for micropatterning biofunctional synthetic surfaces
for applications in biosensing and tissue engineering)

RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L8 ANSWER 107 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:265703 CAPLUS
DN 128:299591
TI Flexible tubular device for use in medical applications
IN Donadio, James V., III; Holmes, David R.; Schwartz, Robert S.; Berry,
David

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PA   Cardia Catheter Co., USA
SO   U.S., 27 pp., Cont.-in-part of U.S. 5,573,520.
     CODEN: USXXAM
DT   Patent
LA   English
IC   ICM  B44C001-22
     ICS  C23F001-02; A61M025-00
NCL  216008000
CC   63-7 (Pharmaceuticals)
FAN.CNT 2
     PATENT NO.         KIND  DATE          APPLICATION NO.   DATE
     ---------------    ----  --------      ---------------   --------
PI   US 5741429          A    19980421      US 1995-455331    19950531
     US 6027863          A    20000222      US 1996-645607    19960514
PRAI US 1991-755614           19910905
     US 1992-940657           19920904
     US 1994-329691           19941026
     US 1995-455331           19950531
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AB Manufg. processes for app., including slotted hypotube, for use as a catheter, a guide wire, a catheter sheath for use with catheter introducers or a drug infusion catheter/guidewire are disclosed. The manufg. process includes creating a pattern of slots or apertures in a flexible metallic tubular member, by processes including but not limited to, electrostatic discharge machining (EDM), chem. milling, **ablation** and **laser** cutting. These slots or apertures may be cut completely or partially through the wall of the flexible metallic tubular member. These manufg. processes may include the addnl. step of encasing the flexible metallic member such that a fluid tight seal is formed around the periphery of the tubular member.

ST flexible tube slotted drug delivery catheter

IT Medical goods
(catheters, sheaths; flexible tubular device for use in medical applications)

IT Medical goods
(catheters; flexible tubular device for use in medical applications)

IT Polymers, biological studies
RL: DEV (Device component use); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(coatings; flexible tubular device for use in medical applications)

IT Drug delivery systems
Lasers
Photoresists
(flexible tubular device for use in medical applications)

IT Coating process
(**masking**; flexible tubular device for use in medical applications)

IT Etching
(**photochem.**; flexible tubular device for use in medical applications)

IT Medical goods
(tubes, intravascular; flexible tubular device for use in medical applications)

IT 12597-68-1, Stainless steel, biological studies 52013-44-2, Nitinol
RL: DEV (Device component use); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(flexible tubular device for use in medical applications)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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(4) Anon; JP 05-225641 1993
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(11) Jacobsen; US 5269882 1993 CAPLUS
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(13) Kamitakahara; US 5147763 1992
(14) Lau; US 5421955 1995 CAPLUS
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L8 ANSWER 108 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:221190 CAPLUS
DN 128:288331
TI Method of preparing **phototool**
IN Sweet, Norman M.
PA Precision Coatings, Inc., USA
SO PCT Int. Appl., 17 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM G03F009-00
ICS G03C001-492; G03C001-725
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9814835	A1	19980409	WO 1997-US17479	19970930
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
	AU 9747398	A1	19980424	AU 1997-47398	19970930
PRAI	US 1996-724189	A	19961001		
	WO 1997-US17479	W	19970930		

AB A **photomask** or other **phototool** is directly prepd. by the imagewise illumination of an azo dye with a high-intensity source of illumination so as to cause the removal of the dye from the imaging medium. Illumination is preferably carried out with a **laser** light source having a wavelength of less than 530 nm and an energy d. of at least 100 mJ/cm2. Disclosed are some specifically preferred azo dyes.
ST **photomask** azo dye **laser ablation**
IT **Photomasks** (lithographic **masks**)
(**laser-ablation** recording materials contg. azo dyes for **photomask** prepn.)
IT Azo dyes
(**laser-ablation** recording materials for **photomask** prepn. contg.)
IT Optical recording materials
(**laser-ablation**; contg. azo dyes for **photomask** prepn.)
RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Dipippo; US 4289839 A 1981 CAPLUS
(2) Henzel; US 5521050 A 1996 CAPLUS
(3) Jain; US 5240807 A 1993 CAPLUS
(4) Loprest; US 4149888 A 1979 CAPLUS

L8 ANSWER 109 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1998:205842 CAPLUS
DN 128:250448
TI Study of the fabrication of the channel waveguide in Ti:sapphire layers
AU Lancok, J.; Jelinek, M.; Bulir, J.; Machac, P.
CS Institute of Physics, Academy of Sciences of the Czech Republic, Prague, 18040/8, Czech Rep.
SO Laser Physics (1998), 8(1), 303-306
CODEN: LAPHEJ; ISSN: 1054-660X
PB MAIK Nauka/Interperiodica Publishing
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB The reactive ion etching (RIE) and the **laser ablation** by KrF excimer **laser** of Ti:sapphire have been investigated as a potential means for micropatterning thin deposited layers for prepn. of the channel waveguide lasers. The RIE was performed in BCl3: He atm. To obtain the high etching selectivity between sapphire and **mask**, the **photoresist**, SiO2, tantalum, and platinum were used as **masks**. Dependencies of etched rate and etched selectivity between **masks** and sapphire on the reactor pressure, on the rf power and on the ratio BCl3: He were investigated. The max. etch rate of Ti: sapphire and 11.9 nm/min together with etch selectivities between sapphire platinum equal to 3.87 and between sapphire and SiO2 equal to 0.55 were achieved. The rib guides were fabricated from thin layers. The **laser** patterning of Ti: sapphire by using KrF excimer **laser** was also studied. To optimize the patterning process, the **ablation** threshold 1.36 J/cm2 and absorption coeff. .alpha. = 1.81 .times. 105 cm-1 were detd. The etch rate and quality of the irradiated surface for KrF **laser ablation** of Ti: sapphire were examd.
ST channel waveguide titanium sapphire layer
IT Optical waveguides
(channel; fabrication of channel waveguide in Ti:sapphire layers)
IT Sputtering
(etching, reactive; fabrication of channel waveguide in Ti:sapphire layers)
IT **Laser ablation**
Optical absorption
(fabrication of channel waveguide in Ti:sapphire layers)
IT Etching
(sputter, reactive; fabrication of channel waveguide in Ti:sapphire layers)
IT 1317-82-4, Sapphire 7440-32-6, Titanium, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(fabrication of channel waveguide in Ti:sapphire layers)
IT 7440-06-4, Platinum, uses 7440-25-7, Tantalum, uses 7631-86-9, Silica, uses
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**mask**; fabrication of channel waveguide in Ti:sapphire layers)
RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Brinkmann, R; Electronics Let 1991, V27, P415 CAPLUS
(2) Dyer, P; Appl Surf Sci 1996, V96-98, P849 CAPLUS
(3) Field, S; Electron Lett 1991, V27, P2375 CAPLUS
(4) Field, S; IEEE 1991, V27, P428 CAPLUS
(5) Field, S; Opt Lett 1992, V17, P52 CAPLUS
(6) Field, S; Opt Lett 1992, V17, P52 CAPLUS
(7) Hanna, D; Appl Phys Lett 1993, V5, P7
(8) Hickey, L; Europ Conf Int Opt Stockholm, Paper PDC-1 1997
(9) Jackson, S; Appl Surf Sci 1995, V86, P223 CAPLUS
(10) Jelinek, M; Proc SPIE 1996, V2888, P51 CAPLUS
(11) Lallier, E; Opt Lett 1990, V15, P682 CAPLUS

(12) Marcuse, D; Bell Syst Tech J 1969, V48, P3187
(13) Park, J; Jpn J Appl Phys 1996, V35, P1550
(14) Pelec, D; Opt Commun V115, P491
(15) Suche, H; Opt Let 1995, V20, P596 CAPLUS
(16) Sugimoto, N; Appl Phys Lett 1995, V67, P582 CAPLUS
(17) Tamir, T; Guided-Wave Optoelectronics, Springer Series in Electronics and Photonics 1988, P26

L8 ANSWER 110 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:202627 CAPLUS
DN 128:277130
TI Process for forming both fixed and variable patterns on single **photoresist** resin **mask**
IN Juengling, Werner
PA Micron Technology, Inc., USA
SO U.S., 8 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM G03F009-00
ICS G03F007-36; G03F009-30
NCL 430312000
CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5733711	A	19980331	US 1996-581766	19960102
PRAI	US 1996-581766		19960102		

AB This invention is embodied in several variations of a process for independently forming both fixed and variable patterns within a single **photoresist** resin layer. In one application of the invention, both a fixed global alignment mark pattern and a variable identification mark pattern are formed in a single **photoresist** resin layer, and both patterns are transferred to an underlying substrate with a single etch step. Each pattern is formed independently of the other, the global alignment mark pattern by exposing the **photoresist** resin on a stepper device, and the identification mark pattern by either exposing or **ablating** the **photoresist** resin with a computer-controlled **laser** beam. Although this invention is described in the context of placing marks on a semiconductor wafer, the method is also applicable to other types of marks on other types of substrates.
ST **photoresist** resin **mask** fixed variable pattern
IT **Photoresists**
(process for forming both fixed and variable patterns on single **photoresist** resin **mask**)
RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anderson; US 5459340 1995
(2) Berker, T; IEEE Electron Device Letters 1981, VEDL-2(11), P281 CAPLUS

L8 ANSWER 111 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1998:68336 CAPLUS
DN 128:121819
TI Manufacture of liquid crystal device by completely dry process and display therefrom
IN Suzuki, Kenkichi; Matsuda, Masaaki; Ogino, Toshio; Hayashi, Nobuaki; Tomita, Yoshifumi
PA Hitachi, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 37 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM G03F007-36

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     ICS  G02F001-13; G02F001-1335; G02F001-136; G03F007-038; G03F007-039
CC   74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other
     Reprographic Processes)
     Section cross-reference(s): 38
FAN.CNT 1
     PATENT NO.       KIND  DATE          APPLICATION NO.  DATE
     ---------------  ----  --------      ---------------  --------
PI   JP 10020509       A2   19980123      JP 1996-176735   19960705
PRAI JP 1996-176735         19960705
```

AB   The device is manufd. by (1) coating a glass substrate for TFT-LCD with a resist comprising a polymer having urethane and/or urea linkage, (2) irradiating the resist with an excimer **laser** through a **mask** to remove the irradiated area by **ablation**, thus forming a resist film pattern, (4) etching the exposed thin film, and (5) irradiating the pattern to remove the remaining resist by **ablation**. The display comprises the above patterned substrate, another substrate having black matrixes and color filters, and a liq.-crystal layer therebetween. The manufg. method requires no wet process and causes no environmental damage due to wastewater. The resist material comprising a polymer having urethane and/or urea linkage shows high **ablation** rate and low debris formation.

ST   liq crystal display substrate patterning; dry process LCD substrate resist patterning; polyurea resist liq crystal display substrate; **ablation** patterning liq crystal display substrate; polyurethane resist liq crystal display substrate

IT   Liquid crystal displays
  Photoresists
  Semiconductor device fabrication
    (manuf. of substrate for liq. crystal device by completely dry process)

IT   Polyureas
  Polyurethanes, processes
  RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
    (resist film; manuf. of substrate for liq. crystal device by completely dry process)

IT   **Laser ablation**
    (resist patterning by; manuf. of substrate for liq. crystal device by completely dry process)

L8   ANSWER 112 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN   1998:66217 CAPLUS
DN   128:147492
TI   Method for forming **mask** for **laser** radiation
IN   Kahlert, Hans-Juergen; Schmidt, Henning; Faulenbach, Udo; Wallscheid, Georg
PA   Microlas Lasersystem G.m.b.H., Germany; Schlingmann G.m.b.H.
SO   Ger., 4 pp.
     CODEN: GWXXAW
DT   Patent
LA   German
IC   ICM B23K026-06
     ICS B32B017-06; B32B015-04; H01S003-02
CC   74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

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FAN.CNT 1
     PATENT NO.       KIND  DATE          APPLICATION NO.  DATE
     ---------------  ----  --------      ---------------  --------
PI   DE 19630739       C1   19980122      DE 1996-19630739 19960730
PRAI DE 1996-19630739       19960730
```

AB   The **mask** for **laser** radiation, esp. excimer **laser** radiation, comprises a glass substrate, an adhesive layer and a metal layer. In manufg. the **mask**, the adhesive layer is removed by **ablation**. The metal layer can be a metal thin film with a thickness .gtoreq.10 .mu.m.

ST   **photomask** excimer **laser** radiation **photolithog**

IT **Photolithography**
  Photomasks (lithographic **masks**)
    (method for forming **mask** for **laser** radiation)
IT 7440-50-8, Copper, uses
  RL: DEV (Device component use); USES (Uses)
    (metal layer of **photomask** comprising)

L8 ANSWER 113 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:787135 CAPLUS
DN 128:55288
TI Possibility of using electrically controlable transparency for **ablation** microlithography with femtosecond **laser** pulses
AU Kitai, M. S.
CS Nauchno-Issled. Tsentr Tekhnol. Lazeram, Ross. Akad. Nauk, Troitsk, Russia
SO Izvestiya Akademii Nauk, Seriya Fizicheskaya (1997), 61(8), 1606-1612
  CODEN: IRAFEO; ISSN: 1026-3489
PB Nauka
DT Journal
LA Russian
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Formation of the **laser** beam profile was studied using elec. controlable transparency comprising rectangular plane sepd. into square cells. Each independently controlled cell can change transmission coeff. of the working radiation wavelength. Transmission coeff. is detd. by elec. potential applied to the controlling electrodes. Each cell is formed by two parallel plates and filled with nematic liq. crystal compn.
ST femtosecond **laser** pulse **ablation** microlithog; liq crystal **photomask** femtosecond **laser** lithog
IT Liquid crystals
    (nematic; possibility of using elec. controllable transparency for **ablation** microlithog. with femtosecond **laser** pulses)
IT Lithography
  Photolithography
  Photomasks (lithographic **masks**)
    (possibility of using elec. controllable transparency for **ablation** microlithog. with femtosecond **laser** pulses)
IT **Photoresists**
    (possibility of using liq. crystal modulator for **ablation** microlithog. with femtosecond **laser** pulses)
IT **Laser** radiation
    (pulsed; possibility of using elec. controllable transparency for **ablation** microlithog. with femtosecond **laser** pulses)

L8 ANSWER 114 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:732099 CAPLUS
DN 128:28642
TI Method for making lithographic printing plate using imaging element comprising thermosensitive **mask**
IN Van Damme, Marc; Vermeersch, Joan
PA Agfa-Gevaert Naamloze Vennootschap, Belg.
SO Eur. Pat. Appl., 15 pp.
  CODEN: EPXXDW
DT Patent
LA English
IC ICM G03F001-00
  ICS B41C001-10
CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 803771	A1	19971029	EP 1997-201048	19970408
	R: DE, FR, GB				
	US 5879861	A	19990309	US 1997-843588	19970416

JP 10062974 A2 19980306 JP 1997-115046 19970418
JP 2988885 B2 19991213
PRAI EP 1996-201085 19960423
AB According to the present invention there is provided a method for making a lithog. printing plate comprising the steps of providing an imaging element comprising on a support having a hydrophilic surface a **photosensitive** layer and a thermosensitive layer, said thermosensitive layer being opaque to light for which said **photosensitive** layer has spectral sensitivity and said thermosensitive layer comprising an IR pigment dispersed in a binder, mounting said imaging element on a drum, imagewise exposing said imaging element by means of an IR **laser** in an internal or external drum configuration thereby **ablating** said thermosensitive layer and rendering it imagewise transparent, overall exposing said imaging element with light to which said **photosensitive** layer has spectral sensitivity, and developing said imaging element to leave an ink-accepting image of said **photosensitive** layer on said support.
ST lithog plate **photosensitive** thermosensitive **masking** layer
IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Special Black 250; lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive **masking** layers contg.)
IT Aminoplasts
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive **masking** layers contg.)
IT Lithographic plates
(**photoimaging** materials with **photosensitive** layers and thermosensitive **masking** layers for manuf. of)
IT **Photoimaging** materials
(with **photosensitive** layers and thermosensitive **masking** layers for manuf. of lithog. plates)
IT 9004-70-0
RL: TEM (Technical or engineered material use); USES (Uses)
(E 950; lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive **masking** layers contg.)
IT 104-15-4, uses 9003-08-1, Cymel 301 86753-78-8, Solsperse 5000 199297-67-1, Solsperse 28000
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive **masking** layers contg.)
IT 57-09-0, Cetyltrimethylammonium bromide 574-93-6, Heliogen Blue D 7565 1652-63-7, Fluorad FC135 9003-20-7D, Poly(vinyl acetate), hydrolized 9011-14-7, Poly(methyl methacrylate) 114535-83-0, Fairmount Diazo 8 190086-16-9, Negalux N18
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with thermosensitive **masking** layers and **photosensitive** layers contg.)

L8 ANSWER 115 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:732098 CAPLUS
DN 128:28641
TI An imaging element and a method for producing a lithographic plate therewith
IN Voortmans, Gilbert; Vermeersch, Joan; Van, Damme Marc; Nouwen, Thomas; Daems, Eddie
PA Agfa-Gevaert Naamloze Vennootschap, Belg.
SO Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW

DT Patent
LA English
IC ICM G03F001-00
ICS B41C001-10
CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 803770	A1	19971029	EP 1997-200907	19970326
	EP 803770	B1	19991215		
	R: DE, FR, GB				
	JP 10055061	A2	19980224	JP 1997-117406	19970422
	JP 2988886	B2	19991213		
PRAI	EP 1996-201081		19960423		

AB According to the present invention there is provided an imaging element comprising on a support having a hydrophilic surface a **photosensitive** layer having sensitivity for light in the wavelength from 300 to 450 nm and a thermosensitive layer comprising a **masking** dye having an absorption peak in the wavelength range from 300 to 450 nm rendering said thermosensitive layer opaque to light for which said **photosensitive** layer has spectral sensitivity and said imaging element further comprising a compd. A capable of converting light into heat being comprised in said thermosensitive layer or a layer adjacent thereto characterized in that said **masking** dye is capable of being **ablated** upon exposure with a **laser** light to which compd. A has absorption.
ST lithog plate **photosensitive** thermosensitive **masking** layer
IT Lithographic plates
(**photoimaging** materials with **photosensitive** layers and thermosensitive **masking** layers for manuf. of)
IT **Photoimaging** materials
(with **photosensitive** layers and thermosensitive **masking** layers for manuf. of lithog. plates)
IT 3234-35-3 4182-80-3 9004-70-0, E 620 47911-98-8 54079-53-7 140234-93-1 152876-71-6 153196-58-8 153196-66-8 153196-71-5
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with **photosensitive** layers and thermosensitive **masking** layers contg.)
IT 57-09-0, Cetyltrimethylammonium bromide 574-93-6, Heliogen Blue D 7565 1652-63-7, Fluorad FC135 9003-20-7D, Poly(vinyl acetate), hydrolyzed 9011-14-7, Poly(methyl methacrylate) 114535-83-0, Diazo No. 8 190086-16-9, Negalux N18
RL: TEM (Technical or engineered material use); USES (Uses)
(lithog. plate manuf. using **photoimaging** materials with thermosensitive **masking** layers and **photosensitive** layers contg.)

L8 ANSWER 116 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:650310 CAPLUS
DN 127:251960
TI Polarizing glass having integral nonpolarizing regions, and method for forming a nonpolarizing region in polarizing glass
IN Borrelli, Nicholas F.; Moore, Chag B.; Sachenik, Paul A.
PA Corning Incorporated, USA; Borrelli, Nicholas F.; Moore, Chag B.; Sachenik, Paul A.
SO PCT Int. Appl., 20 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C03B027-012
ICS C03B031-00; C03B032-00; C03B033-00; C03B037-00; C03C015-00; C03C017-00; C03C025-02

CC 57-1 (Ceramics)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9735812	A1	19971002	WO 1997-US4870	19970325
	W: JP, KR, US				
	RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 889856	A1	19990113	EP 1997-919914	19970325
	EP 889856	B1	20010822		
	R: DE, FR, GB, NL				
	JP 2001510429	T2	20010731	JP 1997-534586	19970325
	KR 2000005020	A	20000125	KR 1998-707640	19980926
	US 6171762	B1	20010109	US 1999-142962	19990521
	US 6524773	B1	20030225	US 2000-649543	20000828
PRAI	US 1996-14619P	P	19960328		
	US 1996-14856P	P	19960404		
	WO 1997-US4870	W	19970325		
	US 1999-142962	A3	19990521		

AB The polarizing glass comprises localized regions or patterns of nonpolarizing glass. The nonpolarizing regions are formed by providing glass having a layer of reducible elongated phase, forming a protected region in the glass by applying a layer of reducing gas-blocking material on the surface of the region to form a pattern of protected and unprotected regions in the glass, subjecting the glass to a reducing gas to reduce the reducible phase in the unprotected region and render the glass polarizing in that region, and removing the layer of reducing gas-blocking material from the protected region to reveal the underlying nonpolarizing glass. The nonpolarizing regions are formed by using reducing gas-blocking material, local heating, **laser ablation**, sandblasting, **laser** scribing, electron beam bombardment, and wet or dry etching. In the reducing gas-blocking method, a shadow **mask** of, e.g., Mo film, was applied, and the glass treated in pure H at 420.degree. for 17 h to obtain a polarizing layer having depth .apprx.30 .mu.m in the unmasked region. This method enables the formation of color gradients and/or designs or patterns in the glass.

ST hydrogen redn glass polarized nonpolarized; **photomask** sputtering glass redn; molybdenum **photomask** sputtering glass redn; chromium **photomask** sputtering glass redn; zinc oxide **photomask** sputtering glass redn

IT Etching
(dry and wet; selective polarization of regions in nonpolarizing glass by)

IT Glass, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nonpolarizing; redn. method for selective polarization of regions in)

IT Polarized light
(redn. method for selective polarization of regions in nonpolarizing glass)

IT Electron beams
Laser ablation
Reduction
Sandblasting
(selective polarization of regions in nonpolarizing glass by)

IT 1333-74-0, Hydrogen, miscellaneous
RL: MSC (Miscellaneous)
(heat-treating in; in selective polarization of regions in nonpolarizing glass)

IT 1314-13-2, Zinc oxide, uses 7439-98-7, Molybdenum, uses 7440-47-3, Chromium, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**photomasks**; in selective polarization of regions in nonpolarizing glass)

L8 ANSWER 117 OF 200 CAPLUS
AN 1997:627861 CAPLUS

DN 127:301011
TI Bragg gratings printed upon thin glass films by excimer **laser** irradiation and selective chemical etching
AU Nishii, Junji; Yamanaka, Hiroshi
CS Department of Optical Materials, Osaka National Research Institute, Agency of Industrial Science and Technology, Ikeda, 563, Japan
SO Applied Optics (1997), 36(27), 6852-6856
CODEN: APOPAI; ISSN: 0003-6935
PB Optical Society of America
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
AB **Photon**-induced property changes of sputter-deposited GeO_2-SiO_2 thin glass films were studied. Irradn. with ArF **laser** pulses induced the changes in refractive index of -10% and vol. of +30% in the film without **ablation**. A Bragg grating with a pos. sinusoid wave pattern was printed upon the film by irradn. with ArF excimer **laser** pulses through a phase **mask**. The irradiated area could be quickly etched by a HF soln. The ratio of etching rate of irradiated area to unirradiated area was >30. A Bragg grating with a surface relief pattern was successfully formed on the film by irradn. with excimer **laser** pulses followed by chem. etching. Diffraction efficiency of the gratings increased by 25 times with the etching.
ST Bragg grating printing glass excimer **laser**; selective chem etching hydrogen fluoride grating
IT Excimer lasers
(Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)
IT Germanosilicate glasses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)
IT Diffraction gratings
(Bragg; Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)
IT **Laser** radiation
(excimer; Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)
IT Refractive index
(pattern; Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)
IT Etching
(selective chem.; Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)
IT 1310-53-8, Germanium dioxide, occurrence 7631-86-9, Silica, occurrence
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)
IT 7664-39-3, Hydrogen fluoride, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(Bragg gratings printed upon thin germanate glass films by excimer **laser** irradn. and selective chem. etching in HF)

L8 ANSWER 118 OF 200 CAPLUS
AN 1997:540137 CAPLUS
DN 127:142811
TI Method and apparatus for patterning resist film by using excimer **laser ablation**
IN Suzuki, Kenkichi; Matsuda, Masaaki; Ogino, Toshio
PA Hitachi, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM G02F001-13
ICS G02F001-1333; G03F001-08; G03F007-20
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09152567	A2	19970610	JP 1995-312723	19951130
PRAI	JP 1995-312723		19951130		

AB The invention relates to a process using a step-scan exposure step and an excimer **laser ablation** development to pattern a resist film on a liq. crystal display element, in which the process moves an exposure **mask** parallel to a liq. crystal crystal element where a thin film pattern will be formed and an excimer **laser** so as to set the beam perpendicular to the **mask**. The app. was also claimed. Use of the process and the app. made patterning of a resist film shorter.
ST excimer **laser ablation** development film patterning; step scan exposure thin film patterning; resist patterning excimer **laser ablation** development
IT **Photolithography**
Resists
(method and app. for patterning resist film by using excimer **laser ablation**)

L8 ANSWER 119 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:460046 CAPLUS
DN 127:168946
TI Lithographic properties of perylenetetracarboxylic acid derivatives films
AU Azarko, V. A.; Scharendo, E. V.; Agabekov, V. E.; Obuchov, V. E.; Tochitsky, E. I.
CS Institute of Physical Organic Chemistry, Belarus Academy of Sciences, Minsk, 220072, Belarus
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3179(Solid State Crystals in Optoelectronics and Semiconductor Technology), 99-102
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Vacuum vapor deposited films (0.5-1.5 .mu.m thickness) of perylene-3,4,9,10-tetracarboxylic acid diimide derivs. (DPTA) (eight compds.) permit to produce **masks** by **laser** vacuum projection lithog. technique. The **masks** have submicron elements (0.6-0.8 mm) and plasma chem. etching (PCE) selectivity ranging from 7 to 15 during PCE of Si, SiO2 and Al. Ion-beam sputtering (IBS) selectivity of the DPTA **masks** during IBS of Cu, Al, GaAs, alloys CdxHg1-xTe (CHT) and YBa2Cu3O7-x (HTSC) by Ar+ ions with the energy of 700 eV were changed from 1.2 (HTSC) to 23.3 (CAT). The influence of chem. structure of the compds. investigated on film IBS rate was discussed.
ST lithog property perylenetetracarboxylic acid deriv film; etching rate perylenetetracarboxylic acid diimide lithog; **photoresists** perylenetetracarboxylic acid diimide lithog
IT Ion beam sputtering
Laser ablation
(of perylenetetracarboxylic acid derivs. films for lithog.)
IT Etching
Etching kinetics
(plasma; plasma chem. etching selectivity of perylenetetracarboxylic acid derivs. films during lithog. processing)

IT **Photoresists**
(vacuum; lithog. properties of perylenetetracarboxylic acid derivs. films)
IT 81-33-4 128-65-4 2379-77-3 5521-31-3 41572-86-5 52000-79-0 52000-81-4 59442-37-4
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(lithog. properties of perylenetetracarboxylic acid derivs. films)
IT 56-23-5, Carbon tetrachloride, uses 76-19-7, Perfluoropropane 2551-62-4 7727-37-9, Nitrogen, uses
RL: NUU (Other use, unclassified); USES (Uses)
(plasma etchant; plasma chem. etching selectivity of perylenetetracarboxylic acid derivs. films during lithog. processing)
IT 14791-69-6, Argon(1+), uses
RL: NUU (Other use, unclassified); USES (Uses)
(sputtering agent; sputtering rate and selectivity of perylenetetracarboxylic acid derivs. films during lithog. processing)
IT 7631-86-9, Silica, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(substrate; plasma chem. etching selectivity of perylenetetracarboxylic acid derivs. films during lithog. processing)
IT 1303-00-0, Gallium arsenide, processes 7429-90-5, Aluminum, processes 7440-21-3, Silicon, processes 7440-50-8, Copper, processes 29870-72-2, Cadmium mercury telluride 109064-29-1D, Barium copper yttrium oxide (Ba2Cu3YO7), oxygen deficient
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(substrate; sputtering rate and selectivity of perylenetetracarboxylic acid derivs. films during lithog. processing)

L8 ANSWER 120 OF 200 CAPLUS
AN 1997:454633 CAPLUS
DN 127:183151
TI AFM study of excimer **laser ablation** of polythiophene films
AU Tsunoda, Katsunori; Ishii, Tadahiro; Tezuka, Yoshihiko; Yajima, Hirofumi
CS Department Applied Chemistry, Faculty Science, Science University Tokyo, Tokyo, 162, Japan
SO Journal of Photochemistry and Photobiology, A: Chemistry (1997), 106(1-3), 21-26
CODEN: JPPCEJ; ISSN: 1010-6030
PB Elsevier
DT Journal
LA English
CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB At. force microscopy (AFM) was used to est. the etching form on excimer **laser ablation** of polythiophene films. Electrochem. prepd. polythiophene films were irradiated with ArF (193 nm) and KrF (248 nm) excimer lasers through a **mask** attached to the film. Single pulse irradn. of these lasers created a well-defined periodic structure on the irradiated region. The periodic structure was ascribed to Fresnel diffraction of the incident beam with the edge of the **mask** and was characteristic of non-fusible polythiophene films. The threshold fluences above which the etching occurs were detd. to be approx. 30 and 50 mJ cm-2 for the 193 nm and 248 nm lasers resp. The emission spectra from the plume suggested that the degree of fragmentation was higher for 193 nm irradn. than for 248 nm irradn. at the same fluence.
ST atomic force microscopy excimer **laser ablation**; etching excimer **laser ablation** polythiophene film; polythiophene film periodic structure Fresnel diffraction; fragmentation excimer **laser ablation** polythiophene film
IT Atomic force microscopy
Etching
Laser ablation
Surface **photolysis**

(at. force microscopy used to est. etching form on excimer
laser ablation of polythiophene films)

IT Fragmentation reaction
(fragmentation in excimer **laser ablation** of
polythiophene films)

IT Optical diffraction
(periodic structure formation in (through **mask**) irradiated
polythiophene films due to Fresnel diffraction of incident beam with
edge of **mask**)

IT 25233-34-5, Polythiophene
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(at. force microscopy used to est. etching form on excimer
laser ablation of polythiophene films)

L8 ANSWER 121 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:432300 CAPLUS
DN 127:142566
TI Modeling of **laser** damage initiated by surface contamination
AU Feit, M. D.; Rubenchik, A. M.; Faux, D. R.; Riddle, R. A.; Shapiro, A.; Eder, D. C.; Penetrante, B. M.; Milam, D.; Genin, F. Y.; Kozlowski, M. R.
CS Lawrence Livermore National Laboratory, Livermore, CA, 94550, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 2966(Laser-Induced Damage in Optical Materials: 1996), 417-424
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 66, 74

AB The authors are engaged in a comprehensive effort to understand and model the initiation and growth of **laser** damage initiated by surface contaminants. This includes, for example, the initial absorption by the contaminant, heating and plasma generation, pressure and thermal loading of the transparent substrate, and subsequent shockwave propagation, splashing of molten material and possible spallation, optical propagation and scattering, and treatment of material fracture. The integration use of large radiation hydrodynamics codes, optical propagation codes and material strength codes enables a comprehensive view of the damage process. The following picture of surface contaminant initiated **laser** damage is emerging from simulations. On the entrance optical surface, small particles can **ablate** nearly completely. In this case, only relatively weak shockwaves are launched into the substrate, but some particulate material may be left on the surface to act as a diffraction **mask** and cause further absorption. Diffraction by wavelength scale scattering centers can lead to significant intensity modulation. Larger particles will not be completely vaporized. The shockwave generated in this case is larger and can lead to spallation of contaminant material which then may be deposited in the substrate. A gaseous atm. can lead to radiation trapping with concomitant increases in temp. and pressure near the surface. Supersonic ionization waves in air may be generated which greatly extend the plasma plume spatially and temporally. Contaminants on the exit optical surface behave differently. They tend to heat and pop off completely in which case significant damage may not occur. Since plasma formed at the interface of the optic and absorbing particle is confined, much stronger pressures are generated in this case. Imaging of contaminants resulting in writing a diffraction pattern on the exit surface due to contamination on the entrance surface was obsd. exptl. and predicted theor. Such imprinted damage regions can seed damage from subsequent pulses.

ST silica **laser** damage threshold surface contamination; aluminum contamination silica surface **laser** damage; titanium contamination silica surface **laser** damage; carbon contamination silica surface **laser** damage; metal contamination silica surface **laser** damage

IT Adsorbed substances
Laser ablation
Optical damage threshold
Photoionization
Shock wave
(modeling of **laser** damage initiated by surface contamination applied to silica)
IT Metals, properties
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(modeling of **laser** damage initiated by surface contamination applied to silica)
IT 7631-86-9, Silica, properties
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(modeling of **laser** damage initiated by surface contamination applied to silica)
IT 7429-90-5, Aluminum, properties 7440-32-6, Titanium, properties
7440-44-0, Carbon, properties
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(modeling of **laser** damage initiated by surface contamination applied to silica)

L8 ANSWER 122 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:415854 CAPLUS
DN 127:102811
TI **Laser** processes for multichip module's high density multilevel thin film packaging
AU Patel, Rajesh S.; Wassick, Thomas A.
CS IBM Microelectronics, Hopewell Junction, NY, 12533, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 2991(Laser Applications in Microelectronic and Optoelectronic Manufacturing II), 217-223
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 76-14 (Electric Phenomena)
Section cross-reference(s): 38
AB Today Multichip Modules (MCMs) have found applications in a variety of fields including computers, telecommunication, automotive industry, and medical diagnosis devices. Lasers are being used as a processing tool for fabricating high d. multilevel thin film packages for MCMs. The two most commonly practiced **laser** processes for multilevel thin film packaging are **laser** via **ablation** and **laser** based circuit repair processes. **Laser** via **ablation** is used for creating via holes in polyimide to provide vertical connection between two adjacent layers of multilevel thin film. It is a dry, precise, and highly robust patterning technol. available today in the packaging industry. The three major aspects of via **ablation** technol. are the **ablation** process, **mask** technol., and tooling. IBM has pioneered the **laser** via **ablation** technol. and has developed all three aspects to use it as a primary technol. for via formation for thin film packages. **Laser** based circuit repair processes have also been developed to a mature state where they are being used on a routine basis to repair circuits in multilevel thin film packages. The need for repair of circuits arises for a variety of reasons including contamination, yield improvement, accommodation of engineering changes or correction of design errors. The commonly practiced **laser** based repair processes are deleting metal shorts using a **laser**, depositing metal using **laser** chem. vapor deposition, and stitching metal lines using **laser** sonic bonding.
ST multichip module **laser** packaging repair; electronic packaging

thin film **laser**; **laser** packaging repair electronic
chip

IT Vapor deposition process
(chem., **laser**-assisted; **laser** processes for high d. multilevel thin film packaging of multichip modules and packaged circuit repair)

IT Electronic packaging process
Laser ablation
Photomasks (lithographic **masks**)
Printed circuit boards
(**laser** processes for high d. multilevel thin film packaging of multichip modules and packaged circuit repair)

IT Polyimides, uses
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(**laser** processes for high d. multilevel thin film packaging of multichip modules and packaged circuit repair)

IT Integrated circuits
(**laser**-based repair of; **laser** processes for high d. multilevel thin film packaging of multichip modules and packaged circuit repair)

IT Semiconductor devices
(multichip modules; **laser** processes for high d. multilevel thin film packaging of multichip modules and packaged circuit repair)

IT Electronic packaging materials
(thin-film; **laser** processes for high d. multilevel thin film packaging of multichip modules and packaged circuit repair)

L8 ANSWER 123 OF 200 CAPLUS

AN 1997:387489 CAPLUS

DN 127:88025

TI **Photomask** repair with near-field optics

AU Lieberman, Klony

CS Nanonics Lithography Ltd., Jerusalem, Israel

SO Microlithography World (1997), 6(2), 4-5
CODEN: MCWRE7; ISSN: 1074-407X

PB PennWell

DT Journal

LA English

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB A **laser photomask** repair tool with the resoln. of focused-ion-beam devices has been developed. Employing recent technol. advances in the field of near-field optics, deep-UV excimer **laser** beams are focused to spots as small as 0.05 .mu.m that are powerful enough to directly **ablate** chrome films off quartz **photomasks** with negligible damage to the substrate.

ST **laser photomask** repair tool lithog

IT **Laser ablation**
Laser radiation
Photomasks (lithographic **masks**)
(**photomask** repair with near-field optics)

IT 7440-47-3, Chrome, uses
RL: NUU (Other use, unclassified); USES (Uses)
(**photomask** repair with near-field optics)

L8 ANSWER 124 OF 200 CAPLUS

AN 1997:338902 CAPLUS

DN 127:42083

TI **Masks** for **laser ablation** technology: new requirements and challenges

AU Speidell, J. L.; Pulaski, D. P.; Patel, R. S.

CS IBM Research Div., Thomas J. Watson Research Center, Yortown Heights, NY, 10598, USA

SO IBM Journal of Research and Development (1997), 41(1/2), 143-149

CODEN: IBMJAE; ISSN: 0018-8646
PB International Business Machines Corp.
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
AB **Laser ablation** is used as a dry patterning process in which an intense beam of light from an excimer **laser** is used to pattern a material directly. This process has found extensive application in the microelectronics industry for patterning of polymer materials. A typical **laser ablation** tool is very similar to a conventional optical lithog. projection tool; the primary difference is the wavelength and the intensity of the light used in the **ablation** process. Conventional chromium-coated quartz **masks** are incompatible with 1 .times. **laser ablation** tools because the chromium layer is rapidly damaged. This paper discusses a **mask** technol. which has been developed specifically for excimer **laser ablation**. The **mask** consists of a quartz substrate with a stack of dielec. films which have been selected for the **laser ablation** wavelength. **Mask** fabrication is accomplished with std. microelectronic processes and equipment. Such **masks** have been used in IBM manufg. since 1987 and have met all process specifications such as resoln., defect d., and damage resistance.
ST **laser ablation** polyimide **photolithog** **photomask**; dielec film **photomask laser ablation photolithog**
IT Dielectric films
  Laser ablation
Microelectronics
  Photolithography
  Photomasks (lithographic **masks**)
   (**laser ablation** patterning of polyimide layers using **photomasks** made of quartz substrate with stack of dielec. films and chrome upper layer)
IT Polyimides, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
   (**laser ablation** patterning of polyimide layers using **photomasks** made of quartz substrate with stack of dielec. films and chrome upper layer)
IT 7440-47-3, Chromium, uses 14808-60-7, Quartz, uses
RL: DEV (Device component use); USES (Uses)
   (**laser ablation** patterning of polyimide layers using **photomasks** made of quartz substrate with stack of dielec. films and chrome upper layer)

L8 ANSWER 125 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:338901 CAPLUS
DN 127:42082
TI Large-field scanning **laser ablation** system
AU Doany, F. E.; Ainsworth, T.; Bobroff, N.; Goodman, D.; Rosenbluth, A. E.
CS IBM Research Div., Thomas J. Watson Research Center, Yorktown Heights, NY, 10598, USA
SO IBM Journal of Research and Development (1997), 41(1/2), 131-142
CODEN: IBMJAE; ISSN: 0018-8646
PB International Business Machines Corp.
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
AB A large-field scanning imaging system has been developed to perform imaging **ablation** using 308-nm excimer **laser** light. A 1 .times. Dyson-like lens images a portion of the **mask** onto a portion of the substrate to be **ablated**. The lens has a field of

12 mm and a numerical aperture of 0.05, providing a resoln. of about 6 .mu.m. A mirror system comprising a roof and a plane mirror, with all three surfaces mutually orthogonal, ensures that the **mask** and the substrate have identical orientations. A common stage is used to hold the **mask** and the substrate. The stage is scanned in a serpentine manner to transfer the entire image. The illuminated region is diamond-shaped, and adjacent scans overlap by half its width to ensure uniformity. Illumination uniformity is provided by a light tunnel in the illumination system. Alignment is performed by optically combining images of **mask** marks and substrate marks formed by a pair of microscope objectives, one viewing the **mask** and the other viewing the substrate. The substrate is leveled, focused, and registered relative to the image of the **mask** by a stage with six degrees of freedom.

ST scanning excimer **laser ablation** electronic packaging; **photolithog** excimer **laser ablation** imaging **photomask**

IT Electronic packaging process
  Laser ablation
  Laser radiation
Lenses
  Photolithography
  Photomasks (lithographic **masks**)
   (large-field scanning excimer **laser ablation** system for electronic package manufg.)

L8 ANSWER 126 OF 200 CAPLUS

AN 1997:331178 CAPLUS

DN 127:72918

TI A novel aluminum on quartz **mask** for excimer **laser** projection **ablation**

AU Patel, R. S.; Speidell, J. L.; Cordes, S. A.

CS IBM Microelectronics, Hopewell Junction, NY, 12533, USA

SO International Journal of Microcircuits and Electronic Packaging (1997), 20(1), 21-26
CODEN: IMEPE5; ISSN: 1063-1674

PB IMAPS - International Microelectronics and Packaging Society

DT Journal

LA English

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73, 76

AB Current excimer **laser** projection **ablation** dielec. **masks** consist of alternating layers of high and low refractive indexes dielec. material on a quartz substrate. Despite the successful use of dielec. in the manufg. environment, due to issues such as fabrication process complexity, high cost compared to Cr on quartz **masks**, and limited no. of **mask** vendors, the dielec. **masks** have remained a specialty **masks**. As an alternative, the authors have developed a novel Al on quartz **mask** structure which can withstand the high **laser** fluence demand of IX stepper **ablation** tools and repetitive usage in manufg. environment, in addn. to the process being economical. The **mask** structure defined is very similar to the Cr on quartz **mask** used for **photolithog**. The proposed **mask** structure has the advantages of a low cost, a use for multiple wavelength **ablation** , and a simple fabrication process. The 3 different **mask** fabrication processes are described. The **ablation** characteristics and the image size control obtained for different **mask** fabrication processes are also described. The static single pulse and repetitive long term damage fluence threshold for the **mask** were detd. All of Al on quartz structure is highly suitable for excimer **laser** projection **ablation** process and is completely compatible to existing 1X projection tooling.

ST aluminum quartz **mask** excimer projection **ablation**

IT **Ablation**

Excimer lasers
  Photomasks (lithographic **masks**)
    (novel aluminum on quartz **mask** for excimer **laser**
    projection **ablation**)
IT 7429-90-5, Aluminum, uses 14808-60-7, Quartz, uses
  RL: DEV (Device component use); USES (Uses)
    (novel aluminum on quartz **mask** for excimer **laser**
    projection **ablation**)

L8 ANSWER 127 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:284945 CAPLUS
DN 126:306883
TI Micromachining with DUV lasers
AU Toenshoff, Hans Kurt; Kappel, Heiner; Heekenjann, Peter
CS Laser Zentrum Hannover e.V., Hanover, 30419, Germany
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3091(Laser Applications Engineering (LAE-96)), 2-12
  CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 48-11 (Unit Operations and Processes)
AB In many industrial branches a continuous scaling down of parts and products is obsd. For example in the fields of micro-mechanics new sensors and actuators can be produced which offer the possibility of making self acting micro-systems. Other micro-components for medicine, chem. or optics allow minimal invasive surgery and inspection. In every case conventional fabrication technologies such as turning and milling have to be carefully investigated; their appropriateness for the prodn. of micro-parts is not always guaranteed. On the other hand new technologies such as the LIGA-process (German acronym for lithog., galvano forming and plastic molding process) open new ways to inexpensive mass-prodn. The potential is described of DUV lasers (**laser** wavelength: .lambda. = 200-280 nm) for micro-machining specific applications. Using excimer-lasers the machining of ceramics, glass, and polymer materials is presented. The excellent beam properties of a self developed quadrupled Nd:YAG-**laser** are used for the repair of **photolithog**. **masks**. The **mask** repair using **ablation** and deposition of chromium on glass substrate is described.
ST micromachining DUV **laser**; ceramics machining excimer **laser**; glass machining excimer **laser**; polymer machining excimer **laser**; **photolithog mask** repair **laser**; chromium **ablation** deposition **mask** repair
IT Ceramics
    (machining of ceramics with excimer lasers)
IT Glass, processes
  RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
    (machining of glass with excimer lasers)
IT Polymers, processes
  RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
    (machining of polymers with excimer lasers)
IT **Laser** radiation
  Micromachining
    (micromachining with DUV lasers)
IT **Photolithography**
    (repair of **photolithog**. **masks** with lasers)
IT 7440-47-3, Chromium, uses
  RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
    (repair of **masks** using **ablation** and deposition of
    chromium on glass substrate)

L8 ANSWER 128 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1997:271904 CAPLUS
DN 126:349629
TI Excimer **ablation** lithography for TFT-LCD
AU Suzuki, Kenkichi; Matsuda, Masaaki; Ogino, Toshio; Hayashi, Nobuaki; Terabayashi, Takao; Amemiya, Kyouko
CS Electron Tube and Devices Division, Hitachi, Ltd., Mobara, 297, Japan
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 2992(Excimer Lasers, Optics, and Applications), 98-107
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB The excimer **ablation** lithog. (EAL) is a process of direct patterning and removal of a resist polymer film by **photodecompn**. **ablation**. Comparing to the conventional **photolithog**., EAL does not need the development process and realizes a non-vacuum dry removal of resist. The main equipment for the new processes is a kind of aligner-exposure for the resist patterning and the removal, which reduce the cost of the clean room and the equipments considerably. This is very attractive for TFT-LCD manufg., as it is required to reduce the cost severely. The large area patterning and high throughput are essential for TFT-LCD applications. To prove the feasibility, we fabricated a exptl. equipment for **ablation** patterning. It is equipped with the high precision 300 .times. 300 mm X-Y stages and a N.A. 0.1 image lens which enable to explore the problems inherent to TFT panel of a real size. In addn., two substantial technologies were developed. One is a dielec. multilayer **mask** on 8" quartz substrate with precision enough for TFT patterns. The other is high **ablation** rate resist polymer. With these technologies, A4 size TFT layer was fabricated by step and scan method. The results show that EAL is in a good prospect for a new TFT manufg. technol.
ST excimer **ablation** lithog liq crystal display; **photodecompn ablation** resist polymer liq crystal
IT **Photolithography**
(direct write; excimer **ablation** lithog. for thin film transistor liq. crystal displays)
IT **Laser ablation**
Liquid crystal displays
Photolysis
Photoresists
Thin film transistors
(excimer **ablation** lithog. for thin film transistor liq. crystal displays)
IT 7429-90-5, Aluminum, processes 7440-21-3, Silicon, processes
7440-25-7, Tantalum, processes 7440-47-3, Chromium, processes
12033-89-5, Silicon nitride, processes 50926-11-9, ITO
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(excimer **ablation** lithog. for thin film transistor liq. crystal displays)

L8 ANSWER 129 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1997:152121 CAPLUS
DN 126:270243
TI Study on excimer **laser** etching of thin aluminum layer deposited on a plastic film
AU Itoh, Yoshifumi; Shimakawa, Tsukasa; Taura, Yoshiharu; Shimazutsu, Hiroaki
CS Mitsubishi Heavy Indust., Ltd. Hiroshima Machinery Work, Hiroshima, 733, Japan
SO Nippon Insatsu Gakkaishi (1996), 33(5), 315-321
CODEN: NIGAEV; ISSN: 0914-3319
PB Nippon Insatsu Gakkai
DT Journal
LA Japanese

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Upon the excimer **laser** irradn. of an aluminum-vapor-deposited layer on a plastic film. **Ablative photo**-decompn. (APD) was obsd. and the aluminum film was area-selectively eliminated. Etching processes are possible without any damage on the film when the XeCl excimer **laser** at an energy level of 450 mJ/30 nsec was used for the treatment of the 400.ANG. aluminum-deposited layer on the plastic film. For the etching processing of continuous treatment on the deposited layer having a wide area, a high power excimer **laser** is necessary. However, a single-shot irradn. with the lasers currently developed for industry does not have enough energy for the continuous processing. Therefore, we designed a new multi-shot **laser** system which can be useful for a continuous processing. The multi-shot **laser** process having a rotating mirror and **mask** can achieve an etching process on continuously conveyed film to draw various patterns through superposition. This paper is described in the etching theory and the multi-shot **laser** etching process.

ST excimer **laser** etching aluminum plastic film

IT Sputtering
(etching, **laser**-enhanced; study on excimer **laser** etching of thin aluminum layer deposited on a plastic film)

IT Etching
(sputter, **laser**-enhanced; study on excimer **laser** etching of thin aluminum layer deposited on a plastic film)

IT **Laser ablation**
(study on excimer **laser** etching of thin aluminum layer deposited on a plastic film)

IT Polyesters, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(study on excimer **laser** etching of thin aluminum layer deposited on a plastic film)

IT 7429-90-5, Aluminum, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(study on excimer **laser** etching of thin aluminum layer deposited on a plastic film)

L8 ANSWER 130 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1997:144069 CAPLUS

DN 126:257297

TI Advanced polymer systems for optoelectronic integrated circuit applications

AU Eldada, Louay; Stengel, Kelly M.T.; Shacklette, Lawrence W.; Norwood, Robert A.; Xu, Chengzeng; Wu, Chengjiu; Yardley, James T.

CS AlliedSignal Inc., Engineered Materials Sector, Electronic and Optical Materials Division, Morristown, NJ, 07962, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3006(Optoelectronic Integrated Circuits), 344-361
CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal; General Review

LA English

CC 76-0 (Electric Phenomena)
Section cross-reference(s): 73

AB A review with 9 refs. An advanced versatile low-cost polymeric waveguide technol. is proposed for optoelectronic integrated circuit applications. The authors have developed high-performance org. polymeric materials that can be readily made into both multimode and single-mode optical waveguide structures of controlled numerical aperture (NA) and geometry. These materials are formed from highly-crosslinked acrylate monomers with specific linkages that det. properties such as flexibility, toughness, loss, and stability against yellowing and humidity. These monomers are intermiscible, providing for precise adjustment of the refractive index from 1.30 to 1.60. Waveguides are formed **photolithog**., with the liq. monomer mixt. polymg. upon illumination in the UV via either

mask exposure or **laser** direct-writing. A wide range of rigid and flexible substrates can be used, including glass, quartz, oxidized silicon, glass-filled epoxy printed circuit board substrate, and flexible polyimide film. The authors discuss the use of these materials on chips and on multi-chip modules (MCM's), specifically in transceivers where the authors adaptively produced waveguides on vertical-cavity surface-emitting lasers (VCSEL's) embedded in Transmitter MCM's and on high-speed **photodetector** chips in Receiver MCM's. Light coupling from and to chips is achieved by cutting 45.degree. mirrors using Excimer **laser ablation**. The fabrication of the authors' polymeric structures directly on the modules provides for stability, ruggedness, and hermeticity in packaging.

ST review polymer optoelectronic integrated circuit

IT Integrated circuits
Optoelectronic semiconductor devices
Photoelectric devices
Waveguides
(advanced polymer systems for optoelectronic integrated circuit applications)

IT Polyimides, uses
Polymers, uses
RL: DEV (Device component use); USES (Uses)
(advanced polymer systems for optoelectronic integrated circuit applications)

IT Electric apparatus
(optoelectronic; advanced polymer systems for optoelectronic integrated circuit applications)

L8 ANSWER 131 OF 200 CAPLUS

AN 1997:66114 CAPLUS

DN 126:179662

TI A low cost **mask** for excimer **laser** projection **ablation**

AU Speidell, J. L.; Patel, R. S.; Cordes, S. A.

CS IBM T. J. Watson Research Center, Yorktown Heights, NY, 10598, USA

SO Proceedings of SPIE-The International Society for Optical Engineering (1996), 2884(16th Annual Symposium on Photomask Technology and Management, 1996), 264-275
CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 74

AB Excimer **laser** projection **ablation** is a dry patterning process in which an intense beam of UV light from an excimer **laser** is used to directly pattern a material. This technique has been used extensively in the microelectronics industry for patterning both org. and inorg. materials. Excimer **laser** projection **ablation** requires the use of a **mask** which is similar to a conventional 1X **photomask**. The **laser ablation mask** must withstand significantly higher energy densities than conventional **photolithog. masks**. A dielec. **mask** structure which consists of a quartz substrate coated with a stack of dielec. thin films has been developed for this process. Although the dielec. **mask** has been used successfully in a manufg. environment, it suffers from the disadvantages of a complex fabrication process and high cost. Alternatives to the dielec. **mask** have been explored and a new **mask** has been developed which consists of an aluminum film on a quartz substrate. This **mask** meets the requirements for the **laser ablation** process and has the advantage of a low cost fabrication process which is similar to conventional chrome on quartz **photomasks**. The **mask** development, specifications, fabrication and results are discussed.

ST aluminum **mask laser ablation** semiconductor

device; lithog **laser ablation** aluminum **mask**

IT **Laser ablation**
  Photomasks (lithographic **masks**)
    (low cost **mask** for excimer **laser** projection
    ablation)

IT Lithography
  Semiconductor devices
    (low cost **mask** for excimer **laser** projection
    ablation for semiconductor technol.)

IT 7429-90-5, Aluminum, uses
  RL: DEV (Device component use); USES (Uses)
    (low cost **mask** for excimer **laser** projection
    ablation for semiconductor technol.)

IT 14808-60-7, Quartz, uses
  RL: DEV (Device component use); USES (Uses)
    (substrate; low cost **mask** for excimer **laser**
    projection **ablation** for semiconductor technol.)

L8 ANSWER 132 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:648286 CAPLUS
DN 126:8940
TI Conducting polymer patterns via **laser** processing
AU Baumann, Reinhard; Bargon, Joachim
CS Institute of Physical Chemistry, University of Bonn, Wegelerstrasse 12, Bonn, D-53115, Germany
SO Applied Surface Science (1996), 106(Proceedings of the Second International Conference on Photo-Excited Processes and Applications, 1995), 287-292
  CODEN: ASUSEE; ISSN: 0169-4332
PB Elsevier
DT Journal
LA English
CC 37-5 (Plastics Manufacture and Processing)
  Section cross-reference(s): 76
AB Two approaches to generate elec. conducting polymer patterns via **laser** processing are presented. The described processes are starting both from elec. insulating material. In the case of elec. insulating precursor polymers from the poly(bis-alkylthio-acetylene) type, the patterning was carried out using the 488 nm argon ion **laser** radiation or the 351 nm XeF excimer **laser** radiation, changing the cond. by up to 16 orders of magnitude to about 100 S/cm in both cases. The second system is based on a UV/**laser**-sensitive precursor composite consisting of a chlorine-contg. polymer and a polymerizable heterocyclic monomeric compd. The two components may vary, but always form the polymn.-starting species by **photo**-induced redox processes. The latent images obtained by exposure through a **mask** can be developed into three-dimensional patterns by wet or dry processes, among them **laser-ablation** techniques.
ST **laser** processing polymer elec cond
IT Electric conductivity
  UV **laser** radiation
    (conducting polymer patterns via **laser** processing)
IT Polyacetylenes, properties
  RL: PRP (Properties)
    (conducting polymer patterns via **laser** processing)
IT 25641-34-3 93975-07-6, Bis(methylthio)acetylene homopolymer
  93975-08-7, Bis(ethylthio)acetylene homopolymer
  RL: PRP (Properties)
    (conducting polymer patterns via **laser** processing)

L8 ANSWER 133 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:648285 CAPLUS
DN 125:336644
TI Excimer **laser** micro machining of inorganic dielectrics
AU Ihlemann, J.; Wolff-Rottke, B.

CS Laser-Laboratorium Goettingen e.V., Hans-Adolf-Krebs-Weg 1, Gottingen, D-37077, Germany
SO Applied Surface Science (1996), 106(Proceedings of the Second International Conference on Photo-Excited Processes and Applications, 1995), 282-286
CODEN: ASUSEE; ISSN: 0169-4332
PB Elsevier
DT Journal
LA English
CC 57-2 (Ceramics)
AB The UV-**photoablation** behavior of glasses and oxide ceramics has been investigated. These materials exhibit a rather low UV-absorptivity compared to many polymers or metals. **Ablation** expts. were carried out with std. excimer lasers (20 ns pulse duration) and short pulse excimer lasers (500 fs). Different **ablation** mechanisms are found: nanosecond **laser** pulses lead to plasma mediated **ablation** in the high fluence regime, whereas the femtosecond **ablation** process is induced by two **photon** absorption. High-quality imaging optics were applied to structure fused silica, borosilicate glass, and alumina with micron-resoln. by ArF-**laser** **ablation**. Two micromachining applications are demonstrated. **Ablation** of dielec. multi-layer systems by **laser** irradn. through the transparent substrate leads to clear structures with micrometer dimensions. **Ablation** using variable **masks** is utilized for the generation of three dimensional surfaces (cylindrical micro lenses).
ST micromachining **laser ablation** ceramic dielec
IT Ceramic materials and wares
(alumina; excimer **laser** micro-machining of glass and ceramic dielecs.)
IT Electric insulators and Dielectrics
(glass and ceramic; excimer **laser** micro-machining of glass and ceramic dielecs.)
IT Glass, oxide
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(borosilicate, dielecs.; excimer **laser** micro-machining of glass and ceramic dielecs.)
IT **Ablation**
(**laser**-induced, micro-machining; excimer **laser** micro-machining of glass and ceramic dielecs.)
IT Machining
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(micro-, **laser ablation**; excimer **laser** micro-machining of glass and ceramic dielecs.)
IT 1344-28-1, Aluminum oxide (Al2O3), processes 60676-86-0, Silica, vitreous
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(dielecs.; excimer **laser** micro-machining of glass and ceramic dielecs.)

L8 ANSWER 134 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:577007 CAPLUS
DN 125:261055
TI High resolution deep UV **laser mask** repair based on near-field optical technology
AU Lieberman, K.; Terkel, H.; Rudman, M.; Ignatov, A.; Lewis, A.
CS Nanonics Lithography Ltd., Jerusalem, 91487, Israel
SO Proceedings of SPIE-The International Society for Optical Engineering (1996), 2793(Photomask and X-Ray Mask Technology III), 481-488
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal

LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB The development of an ultra-high resoln. **laser mask** repair system is described. The revolutionary near-field optical technol. provides significant advantages both in resoln. and in selectivity of the repair process. The sub-wavelength, high energy **laser** beams can **ablate** chrome films with 100 nm. resoln. without damaging the underlying quartz. Online AFM imaging provides 20 nm. resoln. defect review and allows for automated image reconstruction. While the present system is directed solely at opaque defect repair, the near-field technique is also applicable to **photolytic** deposition for clear defect repair. Direct **ablation** of quartz substrates has also been demonstrated and the preliminary data indicates that the technol. holds significant promise for repair of phase shift **masks**.
ST deep UV **laser mask** repair optics; **laser ablation** chrome **photomask** repair lithog
IT **Photomasks**
(high resoln. deep UV **laser mask** repair based on near-field optical technol.)
IT Microscopes
(interference, **laser**, **laser ablation** of chrome in **photomask** repair using near-field optical technol.)
IT **Ablation**
(**laser**-induced, app., **laser ablation** of chrome in **photomask** repair using near-field optical technol.)

L8 ANSWER 135 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:544030 CAPLUS
DN 125:183490
TI Sputter deposition of hydrogenated amorphous carbon film
IN Purushothaman, Sampath; Babich, Edward D.; Callegari, Allessandro C.; Doany, Fuad E.
PA International Business Machines Corp., USA
SO Eur. Pat. Appl., 19 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C23C014-06
ICS G03F001-00
CC 76-11 (Electric Phenomena)
Section cross-reference(s): 75
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 724022	A1	19960731	EP 1996-100260	19960110
	R: DE, FR, GB				
	JP 08225936	A2	19960903	JP 1995-330046	19951219
	US 5830332	A	19981103	US 1997-781080	19970109
PRAI	US 1995-378848	A	19950126		

AB The present invention relates to a method of reactive sputtering for depositing an amorphous hydrogenated C film (a-C:H) from an Ar/hydrocarbon/H/O plasma. Such films are optically transparent in the visible range and partially absorbing at UV and deep UV (DUV) wavelengths, in particular, 365, 248, and 193 nm. Also, the films produced by the present invention are amorphous, hard, scratch resistant, and etchable by excimer **laser ablation** or by O reactive ion etching. Because of these unique properties, these films can be used to form a patterned absorber for UV and DUV single-layer attenuated phase shift **masks**. Film absorption can also be increased such that these films can be used to fabricate conventional **photolithog**. shadow **masks**.
ST sputter deposition hydrogenated amorphous carbon film
IT Sputtering
(deposition by; of hydrogenated amorphous carbon films)

IT Transparent materials
(sputter deposited hydrogenated amorphous carbon films)
IT Hydrocarbons, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sputter deposition of hydrogenated amorphous carbon films from)
IT Cathode-ray tubes
(color, shadow **masks**, sputter deposition of hydrogenated amorphous carbon films as)
IT Lithography
(**photo**-, sputter deposition of hydrogenated amorphous carbon films as **masks** for)
IT 1333-74-0, Hydrogen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sputter deposition of amorphous carbon films contg.)
IT 7440-44-0, Carbon, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(sputter deposition of hydrogenated amorphous carbon films)
IT 74-82-8, Methane, processes 74-84-0, Ethane, processes 74-85-1, Ethene, processes 74-86-2, Acetylene, processes 74-98-6, Propane, processes 74-99-7, Propyne 106-97-8, Butane, processes 107-00-6, 1-Butyne 115-07-1, Propene, processes 115-11-7, Isobutene, processes 503-17-3, 2-Butyne 7440-37-1, Argon, processes 7440-59-7, Helium, processes 7782-44-7, Oxygen, processes 25167-67-3, n-Butene
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sputter deposition of hydrogenated amorphous carbon films from gas mixts. contg.)

L8 ANSWER 136 OF 200 CAPLUS
AN 1996:463369 CAPLUS
DN 125:260574
TI Analysis and application of a 0/1 order Talbot interferometer for 193 nm **laser** grating formation
AU Dyer, P. E.; Farley, R. J.; Giedl, R.
CS Department of Applied Physics, University of Hull, Hull, HU6 7RX, UK
SO Optics Communications (1996), 129(1,2), 98-108
CODEN: OPCOB8; ISSN: 0030-4018
PB Elsevier
DT Journal
LA English
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB The authors report the anal., design and application of a Talbot interferometer in which the zero and 1st order beam from a grating are recombined. This interferometer produces fringes of the same period, d, as the master grating or phase **mask** rather than d/2 when the .+-.1 orders are employed. Expts. using the 0/1 Talbot interferometer with 193 nm ArF **laser** illumination to write gratings on polymers by **ablation** and **photosensitive** Bragg gratings in fibers are reported.
ST Talbot interferometer **laser** grating formation; polymer polyimide polyethersulfone grating **laser ablation**; Bragg grating fiber formation
IT Interferometers
(Talbot; anal. and application of a 0/1 order Talbot interferometer for 193 nm **laser** grating formation)
IT Diffraction gratings
(anal. and application of a 0/1 order Talbot interferometer for 193 nm **laser** grating formation)
IT Polymers, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(anal. and application of a 0/1 order Talbot interferometer for 193 nm **laser** grating formation)
IT Optical fibers

(anal. and application of a 0/1 order Talbot interferometer for 193 nm **laser** grating formation in fibers)

IT Polyimides, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(anal. and application of a 0/1 order Talbot interferometer for 193 nm **laser** grating formation in polymers)

IT 56617-31-3, Argon fluoride
RL: DEV (Device component use); USES (Uses)
(anal. and application of a 0/1 order Talbot interferometer for 193 nm ArF **laser** grating formation)

IT 25667-42-9
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(anal. and application of a 0/1 order Talbot interferometer for 193 nm **laser** grating formation in polymers)

L8 ANSWER 137 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:442793 CAPLUS
DN 125:129172
TI A novel aluminum on quartz **mask** for excimer **laser** projection **ablation**
AU Patel, R. S.; Speidell, J. L.; Cordes, S. A.
CS IBM Microelectronics, Hopewell Junction, NY, 12533, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1996), 2794(Proceedings, 1996 International Conference on Multichip Modules, 1996), 403-408
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 73
AB Current excimer **laser** projection **ablation** dielec. **masks** consist of alternating layers of high and low refractive indexes dielec. material on a quartz substrate. Despite the successful use of the dielec. **masks** in manufg. environment, because of the issues like fabrication process complexity, high cost compared to chromium on quartz **masks**, and limited no. of **mask** vendors, the dielec. **masks** have remained a specialty **masks**. As an alternative we have developed a novel aluminum on quartz **mask** structure which can withstand the high **laser** fluence demand of 1X stepper **ablation** tools and repetitive usage in manufg. environment and is economical. The **mask** structure defined is very similar to the chromium on quartz **mask** used for **photolithog**. The proposed **mask** structure has advantages of low cost, use for multiple wavelength **ablation** and a simple fabrication process. The three different **mask** fabrication processes are described. The **ablation** characteristics and image size control obtained for different **mask** fabrication processes are also described. The static single pulse and repetitive long term damage fluence threshold for the **mask** have been detd. All of the results obtained show that aluminum on quartz structure is highly suitable for excimer **laser** projection **ablation** process and is completely compatible to existing 1X projection tooling.
ST aluminum quartz **mask** excimer **laser ablation**; semicond device aluminum quartz **mask**

IT Semiconductor devices
(aluminum on quartz **mask** for excimer **laser** projection **ablation** in prodn. of)

IT **Ablation**
Laser radiation
(aluminum on quartz **mask** for excimer **laser** projection **ablation** in prodn. of semicond. devices)

IT 7429-90-5, Aluminum, uses 14808-60-7, Quartz, uses

RL: DEV (Device component use); USES (Uses)
   (aluminum on quartz **mask** for excimer **laser**
   projection **ablation**)

L8 ANSWER 138 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:441656 CAPLUS
DN 125:123598
TI Microphotoetching of collagen films by excimer **laser**
   ablation
AU Tezuka, Yoshihiko; Otsuka, Takahiro; Tsunods, Katsunori; Yajima, Hirofumi;
   Ito, Hiroshi; Ishii, Tadahiro
CS Dep. Applied Chem., Sci. Univ. Tokyo, Tokyo, 162, Japan
SO Journal of Photopolymer Science and Technology (1996), 9(2), 277-284
   CODEN: JSTEEW; ISSN: 0914-9244
PB Technical Association of Photopolymers, Japan
DT Journal
LA English
CC 63-7 (Pharmaceuticals)
AB In order to know the applicability of excimer **laser**
   ablation to the microphotoetching of collagen films, they were
   irradiated by an ArF (193 nm) and a KrF (248 nm) excimer **laser**
   through a **mask**. Well-defined patterning of excellent quality
   was attained only by the ArF **laser**, and its threshold fluence
   was 28 mL cm-2. Periodic microstructures were formed on the etched
   surfaces, and their size and shape were dependent on the **laser**
   fluence and the no. of pulses. The mean roughness of the etched surfaces
   increased with the fluence and the no. of pulses with convex relations.
   The summit to summit distance of the periodic structures increased
   linearly with the no. of pulses.
ST collagen etching **laser ablation** biomaterial
IT **Laser** radiation
   Medical goods
   Prosthetic materials and Prosthetics
      (microphotoetching of collagen films by excimer **laser**
      ablation for biomaterials)
IT Collagens, biological studies
   RL: PEP (Physical, engineering or chemical process); THU (Therapeutic
   use); BIOL (Biological study); PROC (Process); USES (Uses)
      (microphotoetching of collagen films by excimer **laser**
      ablation for biomaterials)
IT **Ablation**
      (**laser**-induced, microphotoetching of collagen films by
      excimer **laser ablation** for biomaterials)
IT Etching
      (**photoablative**, **laser**-induced, microphotoetching of
      collagen films by excimer **laser ablation** for
      biomaterials)
IT 34160-02-6, Krypton fluoride (KrF) 56617-31-3, Argon fluoride (ArF)
   RL: BUU (Biological use, unclassified); BIOL (Biological study); USES
   (Uses)
      (microphotoetching of collagen films by excimer **laser**
      ablation for biomaterials)

L8 ANSWER 139 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:435307 CAPLUS
DN 125:80780
TI Sodium hyaluronate viscous solutions for use as **masking** fluid in
   therapeutic **photokeratectomy** by means of excimer **laser**
IN Cantoro, Amalio
PA Chemedica S.A., Switz.
SO Eur. Pat. Appl., 19 pp.
   CODEN: EPXXDW
DT Patent
LA English
IC ICM A61K031-715

CC 8-9 (Radiation Biochemistry)
Section cross-reference(s): 63

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 719559	A1	19960703	EP 1995-119025	19951204
	EP 719559	B1	19980930		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
	AT 171623	E	19981015	AT 1995-119025	19951204
	ES 2124486	T3	19990201	ES 1995-119025	19951204
	CA 2164770	AA	19960610	CA 1995-2164770	19951208
	ZA 9510441	A	19960619	ZA 1995-10441	19951208
	JP 08253505	A2	19961001	JP 1995-345903	19951208
	US 5871772	A	19990216	US 1995-570097	19951211
PRAI	IT 1994-RM797		19941209		

AB Sodium hyaluronate viscous aq. solns. of mol. wt. from 1,200,000 to 2,200,000 Daltons at concns. from 0.10% to 0.40% by wt. are proposed for use as **masking** fluid in therapeutic **photokeratectomy** by means of excimer **laser**, which realizes the **ablation** of superficial layers of corneal tissue for the elimination of unevenness and macula derived from different traumatic or pathol. conditions. Preferably, the proposed solns. also contain one or more cationic species selected from the group consisting of sodium, potassium, calcium and magnesium ion and one or more anionic species selected from the group consisting of chloride, phosphate and citrate ion and, preferably, glucose. The solns. according to the invention wet the cornea and protect its areas which remain distressed after surgery, enabling the obtainment of uniform and smooth **ablated** surfaces. Further, they enable the execution of intraoperative corneal topog. tests. Results of a clin. trial are included.

ST sodium hyaluronate soln eximer **laser photokeratectomy**

IT Eye
(cornea, sodium hyaluronate viscous solns. for **masking** fluid in therapeutic **photokeratectomy** by means of excimer **laser**)

IT Lasers
(excimer, sodium hyaluronate viscous solns. for **masking** fluid in therapeutic **photokeratectomy** by means of excimer **laser**)

IT Pharmaceutical dosage forms
(ophthalmic, sodium hyaluronate viscous solns. for **masking** fluid in therapeutic **photokeratectomy** by means of excimer **laser**)

IT 50-99-7, Glucose, biological studies 68-04-2, Trisodium citrate 126-44-3, Citrate, biological studies 7439-95-4, Magnesium, biological studies 7440-09-7, Potassium, biological studies 7440-23-5, Sodium, biological studies 7440-70-2, Calcium, biological studies 7447-40-7, Potassium chloride, biological studies 7558-79-4, Disodium hydrogen phosphate 7647-14-5, Sodium chloride, biological studies 7786-30-3, Magnesium chloride, biological studies 9067-32-7, Sodium hyaluronate 10043-52-4, Calcium chloride, biological studies 14265-44-2, Phosphate, biological studies 16887-00-6, Chloride, biological studies
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(sodium hyaluronate viscous solns. for **masking** fluid in therapeutic **photokeratectomy** by means of excimer **laser**)

L8 ANSWER 140 OF 200 CAPLUS

AN 1996:427128 CAPLUS

DN 125:99865

TI **Photoresist**-free microstructuring of III-V semiconductors with **laser**-assisted dry etching **ablation**

AU Dubowski, J. J.; Bielawski, M.; Mason, B.

CS Institute Microstructural Sciences, National Research Council Canada, Ottawa, ON, K1A 0R6, Can.

SO Proceedings of SPIE-The International Society for Optical Engineering (1996), 2703(Lasers as Tools for Manufacturing of Durable Goods and Microelectronics), 405-410
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
AB The progress in manufg. of integrated microelectronic and optoelectronic devices requires new technologies which would make possible printing of nanometer-size features and/or which would offer cost effective solns. in the fabrication of micrometer-size devices. **Laser**-induced direct (**photoresist**-free) patterning of materials has been recently investigated as a method that has some potential in that area. We have applied **laser**-assisted dry etching **ablation** for contact, proximity and projection **mask** lithog. of III-V semiconductor films, quantum wells and superlattices. It has been shown that micrometer-size structures of those materials can be directly fabricated following the exposure to an excimer **laser** radiation in an atm. of chlorine dild. in helium. The results indicate that the process has the potential for the fabrication of high-quality quantum wire and quantum dot structures.
ST **laser** assisted dry etching **ablation**
photolithog
IT **Photomasks**
(**photoresist**-free microstructuring of III-V semiconductors with **laser**-assisted dry etching **ablation**)
IT Lithography
(**photo-**, **photoresist**-free microstructuring of III-V semiconductors with **laser**-assisted dry etching **ablation**)
IT Etching
(**photochem.**, **laser**-induced, **photoresist** -free microstructuring of III-V semiconductors with **laser** -assisted dry etching **ablation**)
IT 7782-50-5, Chlorine, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(etchant; **photoresist**-free microstructuring of III-V semiconductors with **laser**-assisted dry etching **ablation**)
IT 22398-80-7, Indium phosphide (InP), processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**photoresist**-free microstructuring of III-V semiconductors with **laser**-assisted dry etching **ablation**)
IT 7704-34-9, Sulfur, uses
RL: MOA (Modifier or additive use); USES (Uses)
(**photoresist**-free microstructuring of III-V semiconductors with **laser**-assisted dry etching **ablation**)

L8 ANSWER 141 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1996:267913 CAPLUS
DN 124:329728
TI A technology for 2-dimensional HTS Josephson junctions arrays
AU Martinoli, P.; Jeanneret, B.; Tsaneva, V.; Luthy, T.; Ariosa, D.; Leemann, C.; Lerch, PH.; Burger, J.
CS Institut de Physique, Universite de Neuchatel, Neuchatel, 2000, Switz.
SO Bulgarian Journal of Physics (1995), 22(1-2), 44-59
CODEN: BJPHD5; ISSN: 0323-9217
PB Izdatelstvo na Bulgarskata Akademiya na Naukite
DT Journal
LA English
CC 76-4 (Electric Phenomena)

Section cross-reference(s): 57, 74

AB A technol. for fabricating 2-dimensional JJA consisting of a periodic square network of high Tc superconducting nodes sepd. by identical step edge junctions is presented. It includes: (i) step formation by ion beam etching of the **masked** substrate; (ii) YBCO blanket film deposition by **laser ablation**; (iii) array formation by ion beam etching of the HTS film. Some technol. peculiarities of the processes and their impact on film quality are discussed. The films and networks were studied by x-ray diffraction, 4-point and contactless resistance temp. dependence measurements. At. Force Microscopy was used for sample characterization. The samples dynamic response to a small a.c. signal was studied by a two-coil inductance method. The obsd. oscillations in external magnetic field confirm the possibility to consider thus prepd. samples as 2-dimensional JJA.

ST barium copper yttrium oxide Josephson junction

IT Sputtering
(magnetron; technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT Electric resistance
(technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT Superconductor devices
(Josephson junctions, technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT Sputtering
(etching, ion-beam, technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT **Ablation**
(**laser**-induced, technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT Lithography
(**photo**-, technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT Etching
(sputter, ion-beam, technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT 7440-03-1, Niobium, processes 7440-32-6, Titanium, processes 7440-47-3, Chromium, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(etching **mask**; technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT 12060-59-2, Strontium titanate
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(substrate; technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT 107539-20-8, Barium copper yttrium oxide
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT 14791-69-6, Argon(1+), processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

IT 2551-62-4, Sulfur hexafluoride 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(technol. for fabrication of 2-dimensional cuprate superconducting Josephson junction arrays)

L8 ANSWER 142 OF 200 CAPLUS

AN 1996:73727 CAPLUS

DN 124:124258

TI Manufacture of metal **masks** and their reuse
IN Nakanishi, Teru; Karasawa, Kazuaki
PA Fujitsu Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C23C014-04
ICS H01L021-203
CC 56-13 (Nonferrous Metals and Alloys)
Section cross-reference(s): 38, 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07300664	A2	19951114	JP 1994-91875	19940428
PRAI	JP 1994-91875		19940428		

AB A thin metal sheet is etched to form holes in certain locations, provided with heat-resistant resin film, and the film is irradiated with **laser** beam from the metal side for **ablation** of the films at the holes to form a metal **mask**. The **mask** is tightly placed on a substrate for selective film formation, and the resin film is removed from the **mask** for its reuse. The **masks** are useful in semiconductor fabrication.
ST **mask** metal polymer film reuse; semiconductor fabrication metal **mask**
IT **Photomasks**
(in manuf. of metal **masks** for semiconductor fabrication)
IT Semiconductor devices
(metal **masks** for fabrication of)
IT 25036-53-7, Kapton
RL: DEV (Device component use); USES (Uses)
(in manuf. of metal **masks** for semiconductor fabrication)
IT 39332-67-7, Kovar
RL: DEV (Device component use); USES (Uses)
(**masks** for semiconductor fabrication)

L8 ANSWER 143 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:880532 CAPLUS
DN 124:38139
TI Velocity selection of **laser ablated** metal atoms by a novel non-mechanical technique
AU Fajardo, Mario E.; Macler, Michel
CS Emerging Technologies Branch, Propulsion Directorate, Phillips Lab., Edwards Air Force Base, CA, 93524-7680, USA
SO Materials Research Society Symposium Proceedings (1995), 388(Film Synthesis and Growth Using Energetic Beams), 39-44
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
CC 65-5 (General Physical Chemistry)
Section cross-reference(s): 76
AB The authors present the results of expts. on velocity selection of fast **laser ablated** Al, Ga, and In atoms by novel, nonmech., technique. Pulses of atoms with broad velocity distributions are produced by **laser ablation** of a single component pure metal target in vacuum. After a delay of .apprx.1 .mu.s, there exists a strong 1-to-one correlation between at. velocity and distance traveled from the **ablated** surface. Thus, a 2nd pulsed **laser**, delayed by .apprx. 1 .mu.s and crossed at a ring angle to the beam, can be used to **photoionize** only those atoms with unwanted velocities, i.e.: atoms moving too fast or too slow to be hidden behind an opaque **mask** placed .apprx.1 cm from the **ablated** surface. The **photoions**, and any ions surviving from the **ablation** event, are subsequently deflected from the beam by a static magnetic

field. By a fortunate coincidence, Al, Ga, and In atoms all have very large single **photon photoionization** cross sections at 193 nm, the output wavelength of the ArF excimer **laser**; thus, well over 85% of the unwanted atoms can be easily **photoionized** and rejected. The authors demonstrated velocity selected Al, Ga, and In atom fluxes equiv. to .PHI. .apprx. 1011 atoms/(cm2-eV-pulse) at a working distance of 10 cm.

ST **laser ablated** metal atom velocity selection;
photoionization metal atom velocity selection **ablated**

IT Ionization, **photo-**
Laser radiation
Magnetooptical effect
(velocity selection of **laser ablated** metal atoms by a novel non-mech. technique)

IT Metals, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(velocity selection of **laser ablated** metal atoms by a novel non-mech. technique)

IT **Ablation**
(**laser**-induced, velocity selection of **laser ablated** metal atoms by a novel non-mech. technique)

IT 7429-90-5, Aluminum, properties 7440-55-3, Gallium, properties 7440-74-6, Indium, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(velocity selection of **laser ablated** metal atoms by a novel non-mech. technique)

L8 ANSWER 144 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:804431 CAPLUS
DN 123:213454
TI Method for backside **photoinduced ablation** for making color filter
IN Chen, Sheau-Sheng; Dang, Theodore Huu; Sun, Hongye
PA XMR, Inc., USA
SO PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM G03C007-12
ICS G02F001-1335
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9513566	A1	19950518	WO 1994-US12991	19941110

W: CN, JP, KR
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

PRAI US 1993-149883 19931110

AB A method of backside **photoinduced ablation**, in which a **laser** is directed through a **mask** at the back side of a light-transmitting substrate, and the **ablated** areas are then filled with a filling material. This technique may be used as a method of making color filters, by repeatedly **ablating** different areas and filling with different colored filling materials.

ST **photoablation** color filter display device

IT Optical filters
(prepn. by **photoablation** for liq.-crystal display devices)

IT Optical imaging devices
(electrooptical liq.-crystal, color filter prepn. by **photoablation** for)

IT **Ablation**
(light-induced, color filter prepn. for liq.-crystal display devices

by)

L8 ANSWER 145 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:675949 CAPLUS
DN 123:241728
TI Projection **laser ablation mask** alternatives
AU Patel, R. S.; Advocate, W. H.; Mukkavilli, S.
CS IBM Microelectronics Division, Hopewell Junction, NY, 12533-6531, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1995), 2575(Multichip Modules), 320-6
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
AB Projection **laser ablation** technol. has been used by the IBM since early 1980s for via formation in polymers used to fabricate high d. multilevel thin film multichip modules (MCMs). The current **ablation** technol. uses dielec. **mask** to define the via pattern. Despite the successful use of the dielec. **masks** in manufg. environment, when compared to std. Cr on quartz type **masks** , dielec. **masks** have drawbacks of high cost, long turn around time, and limited no. of **mask** suppliers. These drawbacks have lead to the investigation of other alternatives for projection **laser ablation mask**. Three **mask** structures have been studied as a potential alternative to dielec. **mask**. The **mask** structures studied are, std. **photolithog**. Cr metal on quartz **mask**, Al/Cu dual metal on quartz **mask**, and binary phase shifted grating quartz **mask**. The **ablation** tool and process considerations and **ablated** feature characteristics assocd. with each **mask** structure are discussed. Also, fabrication process steps for these alternative **mask** structures are described. Initial results show that each one of the **mask** structure can be developed into a manufg. level **mask** technol. depending upon the **mask** specification, **ablation** tool and process practiced, and **ablated** feature requirements.
ST metal quartz **photomask** projection **laser ablation**; binary phase shift grating **photomask photolithog**
IT Diffraction gratings
Photomasks
(metal on quartz and binary phase shifted grating **masks** for projection **laser ablation** in lithog.)
IT **Ablation**
(**laser**-induced, metal on quartz and binary phase shifted grating **masks** for projection **laser ablation** in lithog.)
IT Lithography
(**photo**-, metal on quartz and binary phase shifted grating **masks** for projection **laser ablation** in lithog.)
IT 7429-90-5, Aluminum, uses 7440-47-3, Chromium, uses 7440-50-8, Copper, uses 14808-60-7, Quartz, uses
RL: DEV (Device component use); USES (Uses)
(metal on quartz and binary phase shifted grating **masks** for projection **laser ablation** in lithog.)

L8 ANSWER 146 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:649257 CAPLUS
DN 123:271941
TI UV-excimer **laser ablation** patterning of II-VI compound semiconductors

AU Key, P. H.; Sands, D.; Wagner, F. X.
CS Department Applied Physics, University Hull, Hull, HU6 7RX, UK
SO Materials Science Forum (1995), 173-174, 59-66
CODEN: MSFOEP; ISSN: 0255-5476
DT Journal
LA English
CC 76-2 (Electric Phenomena)
AB Pulsed excimer **laser ablation** characteristics of ZnS, CdTe, and ZnSe crystals have been studied using 248 nm and 308 nm radiation in vacuum and in argon at pressures up to 2.times.103 mbar. The depth of material removed per pulse is shown in most cases to hold a Beer's Law relationship to **laser** fluence (energy/unit area). The threshold fluence for these materials is typically in the range 120-150 mJ cm-2 in vacuum, and is found to be increased by raising the ambient pressure. We have exploited the low threshold fluence in vacuum to pattern epitaxial thin films of CdTe using a conformal **mask** of conventional **photo**-resist which has been exposed and developed in the normal way. Blanket exposure causes both the exposed CdTe and the **photo**-resist to be **ablated** but the relative **ablation** rates of the two materials allows shallow features to be etched into the CdTe. The max. depth we have achieved is in excess of 600 nm.
ST **laser ablation** patterning II VI semiconductor
IT Lithography
(UV-excimer **laser ablation** patterning of II-VI compd. semiconductors)
IT Group IIB element chalcogenides
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(UV-excimer **laser ablation** patterning of II-VI compd. semiconductors)
IT **Ablation**
(**laser**-induced, UV-excimer **laser ablation** patterning of II-VI compd. semiconductors)
IT 1306-25-8, Cadmium telluride (CdTe), processes 1314-98-3, Zinc sulfide (ZnS), processes 1315-09-9, Zinc selenide (ZnSe)
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(UV-excimer **laser ablation** patterning of II-VI compd. semiconductors)

L8 ANSWER 147 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:638013 CAPLUS
DN 123:156228
TI Fabrication of YBa2Cu3Ox thin-film flux transformers using a novel microshadow **mask** technique for in situ patterning
AU Strikovski, M. D.; Kahlmann, F.; Schubert, J.; Zander, W.; Glyantsev, V.; Ockenfuss, G.; Jia, C. L.
CS Institut Schicht Ionentechnik, Forschungszentrum Juelich, Juelich, D-52425, Germany
SO Applied Physics Letters (1995), 66(25), 3521-3
CODEN: APPLAB; ISSN: 0003-6951
PB American Institute of Physics
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76
AB A novel microshadow **mask** technique for in situ patterning of multilayers is presented. It is ideally suited to fabricate YBa2Cu3Ox(YBCO) and insulator lines with gently sloping edges, needed for high quality insulated superconducting crossovers. The crit. c.d. jc (T = 77 K) of a YBCO/SrTiO3/YBCO crossover exceeds 2 .times. 106 A/cm2 in both the bottom and the top YBCO stripline. The insulating SrTiO3 layer of 200 nm thickness displays a high resistivity of p > 108 .OMEGA. cm (T = 77 K). The extremely smooth morphol. of the edges has been revealed by cross sectional transmission electron microscopy, indicating a stepflow

mechanism of YBCO growth. Multiturn flux transformers with a 15 .mu.m linewidth input coil spiral have been fabricated by this microshadow **mask** technique. A transformer with a pickup loop area of 7 mm2 has been coupled to a 1 mm2 washer dc SQUID in flip chip geometry. In comparison to the bare SQUID a magnetic flux gain factor of 9 has been obtained. The white noise level of this setup was detd. to be 8 .times. 10-5 .PHI.0/Hz1/2 at 77 K. It was entirely due to the intrinsic noise of the employed dc SQUID itself. The I/f noise level increased a factor of 2.

ST barium copper yttrium oxide film transformer; microshadow **photomask** multiturn flux transformer fabrication

IT **Photomasks**
(fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT Vapor deposition processes
(**laser ablation**, fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT Lithography
(**photo**-, fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT Superconductor devices
(quantum interference, fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT Transformers
(superconductive, fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT Superconductor devices
(transformers, fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT 1305-78-8, Calcium oxide (CaO), uses 1314-23-4, Zirconium oxide (ZrO2), uses
RL: DEV (Device component use); USES (Uses)
(amorphous layer; fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT 107539-20-8, Barium copper yttrium oxide
RL: DEV (Device component use); USES (Uses)
(fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT 12060-59-2, Strontium titanate (SrTiO3)
RL: DEV (Device component use); USES (Uses)
(insulating layer; fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

IT 104137-08-8, AZ5214
RL: TEM (Technical or engineered material use); USES (Uses)
(resist; fabrication of barium copper yttrium oxide thin-film flux transformers using microshadow **mask** technique)

L8 ANSWER 148 OF 200 CAPLUS

AN 1995:625807 CAPLUS

DN 123:212881

TI Computer-generated holographic diffractive structures fabricated by direct excimer **laser** microetching

AU Boutsikaris, L.; Mailis, S.; Madamopoulos, N.; Pissadakis, S.; Petrakis, A.; Vainos, N. A.; Dainty, P.; Parmiter, P.; Hall, T. J.

CS Institute Electronic Structure and Laser, Foundation Research and Technology, Crete, 71110, Greece

SO Proceedings of SPIE-The International Society for Optical Engineering (1995), 2403, 448-55
CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Excimer **laser** microetching is applied on various substrate

materials, including metals, metal alloys, semiconductors, and polymers, of arbitrary geometrical shape for fabricating surface-relief optical microstructures with very fine features (micron width/.mu. depth, or less). Particularly good results have been obtained with hardened **photoresist**, lithium niobate crystals, and stainless steel. The method is based on selective **laser ablative** etching achieved by projecting a **mask**, on a redn. basis, onto the substrate material. In addn. to simple rectangular metal **masks**, computer generated holog. **mask** patterns were used. These hologram masters were optically plotted on **photoresist**, and then wet etched to produce chrome-on-quartz **masks**. A consecutive step-and-repeat method was used to replicate the **mask** on the substrate. Several types of surface relief holograms were directly etched on various materials. One class of holograms upon reconstruction produces an 8.times.8 square optical interconnect array. Another type reproduces a specific design pattern consisting of characters and nos. Full automation of the microetching process in conjunction with a raster scanning method allows the fabrication of arbitrary pixellated multi-level micro-patterns. The direct nature of the etching technique appears to be very attractive, since it eliminates the need for substrate material pre- or post-processing and can be applied to almost any solid material.

ST excimer **laser** microetching holog diffractive structure

IT Holography
(computer-generated holog. diffractive structures fabricated by direct excimer **laser** microetching)

IT Etching
(**photochem**., **laser**-induced, computer-generated holog. diffractive structures fabricated by direct excimer **laser** microetching)

L8 ANSWER 149 OF 200 CAPLUS COPYRIGHT 2003 ACS on STN
AN 1995:625801 CAPLUS
DN 123:243186
TI Microwave-assisted **laser** dry etching of silicon
AU Pfleging, W.; Kreutz, E. W.; Wehner, M.; Lupp, F.
CS Lehrstuhl fur Lasertechnik, Rheinisch-Westfalische Technische Hochschule Aachen, Aachen, D-52074, Germany
SO Proceedings of SPIE-The International Society for Optical Engineering (1995), 2403, 387-93
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 35, 73, 74

AB A combination of microwave excitation and a **mask** projection scheme is applied for laterally structured etching of Si. The technol. is based on polymn. of an inert overlayer, which protects the Si surface from the etching gas. After **ablating** the polymer from the Si surface with pulsed excimer **laser** radiation the surface is exposed to an etching gas atm. Different feed gases were used, such as CF4, either nonactivated or activated in a microwave discharge. With these etching gases well-defined structures can be achieved with etching rates of 0.1 .mu.m/min. Using a gas mixt. of CF4 and CCl4 the etching rate can be increased to 1 .mu.m/min. Smooth etching profiles can be achieved with **laser** fluences <0.6 J/cm2. Further, for the Si etching with MMA (Me methacrylate) polymn. suitable processing variables for these competitive processes were obtained. The deposited polymer films and etched Si surfaces were characterized by ex-situ electron spectroscopies (XPS, AES) and the gas phase reactions were studied with quadrupole mass spectroscopy (QMS). The formation of ClF3 or ClF is discussed as a crit. step within the microwave-assisted **laser** dry etching (MALDE) process. The presence of these species correlates with high Si etch rates.

ST **laser** plasma etching polymn silicon substrate; fluoromethane **laser** plasma etching polymn silicon; chloromethane **laser**

plasma etching polymn silicon; methylmethacrylate **laser** plasma
etching polymn silicon

IT **Photolysis**
(carbon tetrachloride; microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT Kinetics of etching
(microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT Sputtering
(etching, microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT **Ablation**
(**laser**-induced, microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT Kinetics of polymerization
Polymerization
(plasma, microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT Etching
Kinetics of etching
(sputter, microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT 7790-89-8, Chlorine fluoride (ClF) 7790-91-2, Chlorine fluoride (ClF3)
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT 75-73-0, Carbon fluoride (CF4) 80-62-6, MMA
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT 56-23-5, Carbon tetrachloride, processes
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT 9011-14-7P, PMMA
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process)
(microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

IT 7440-21-3, Silicon, processes
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(microwave-assisted **laser** dry etching of silicon for lateral structuring using polymn. of MMA)

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